



**Triennial Report  
of the International  
Ergonomics Association  
2018-2021**



A global federation of human factors and ergonomics societies. Founded in 1959.

# IEA Triennial Report 2018-2021

1. PRESIDENT'S ADDRESS .....	1
2. ABOUT THE DISCIPLINE OF HUMAN FACTORS/ERGONOMICS .....	5
2.1. <i>Definition and applications</i> .....	5
2.2. <i>Stakeholders of HF/E</i> .....	6
2.3. <i>Value of HF/E in the world of work</i> .....	6
3.1. <i>Birth and development of IEA</i> .....	7
3.2. <i>IEA Governance</i> .....	8
3.4. <i>IEA Standing Committees</i> .....	11
4. IEA MEMBERSHIP .....	13
4.1. <i>IEA Federated Societies</i> .....	13
4.2. <i>IEA Affiliated Societies</i> .....	14
4.3. <i>IEA Networks</i> .....	14
4.4. <i>IEA Sustaining Members</i> .....	15
5. EXTERNAL ORGANIZATIONS AND LIAISONS .....	18
5.1. <i>Non-Governmental Organizations (NGOs): UN, ILO, and WHO</i> .....	18
5.2. <i>National and International Organizations for Standardization and Guidelines</i> .....	20
5.3. <i>Professional Societies and Scientific Committees</i> .....	21
5.4. <i>Academia and IEA Relationships</i> .....	21
5.5. <i>Community and IEA Network Relationships Promoting HF/E practices</i> .....	21
6. IEA STRATEGIC PLAN 2018-2021 .....	22
6.1. <i>IEA Mission Statement</i> .....	22
6.2. <i>IEA Goals</i> .....	22
6.3. <i>IEA Strategic Policies</i> .....	26
7. IEA ACTIVITIES AND ACHIEVEMENTS – 2018-2021 .....	30
7.1. <i>Overview</i> .....	30
7.2. <i>Financial Report</i> .....	32
7.3. <i>Infrastructure</i> .....	40
7.4. <i>Awards Standing Committee</i> .....	46
7.5. <i>Communications and Public Relations Standing Committee</i> .....	49
7.6. <i>Development and Promotion Standing Committee</i> .....	55
7.7. <i>International Development Standing Committee</i> .....	60
7.8. <i>Professional Standards and Education Standing Committee</i> .....	65
7.8a. <i>Certification Subcommittee</i> .....	69
7.9. <i>Science, Technology, and Practice Standing Committee (STP)</i> .....	74
7.10. <i>Ad Hoc Committee: Future of Work Task Force (FoW)</i> .....	79
7.11. <i>IEA2021: HF/E in the Connected World</i> .....	85
8. RECOMMENDATIONS FOR THE FUTURE .....	103
9. IEA REPRESENTATION AND OUTREACH TO MEMBERS AND EXTERNAL STAKEHOLDERS.....	105
10. APPENDICES .....	111
10.1. <i>IEA Executive Committee</i> .....	111
11.2. <i>Past Officers</i> .....	112
11.3. <i>Past IEA Triennial Congresses</i> .....	114
11.4. <i>Past Meetings of IEA Council</i> .....	114

# 1. President's Address

## Kathleen Mosier, IEA President

As I write this President's Address, we are about to launch IEA2021 - the first ever virtual IEA Triennial Congress. The journey to this virtual Congress has been unprecedented. The organizers did an amazing job of pivoting from an in-person, to a hybrid, to a virtual conference and I salute them and applaud their success.



The Triennial Congress as well as other IEA initiatives and activities are guided by 7 Strategic Policies developed by Past President Yushi Fujita and honed during the current term (see Section 6.3). These policies address our mission and goals and serve as a framework for planning and prioritizing activities. As you will see from the brief summaries below, this has been a challenging but very productive term. I encourage you to read the reports from EC members in this Triennial Report for a full picture of all projects and activities.

### ***Policy 1. Engage Stakeholders***

Communication with and engagement of our stakeholders has been a priority during this term. We initiated IEA NewsBriefs, a monthly communication to our members and external partners. We conducted several surveys with our members to assess their perceived priority of IEA activities and resources as well as their predictions of future trends for HF/E and work. IEA initiated the IEA Webinar Series, targeted for member societies and other stakeholders. The first IEA webinar on *Pandemic and Preparedness* garnered international registrants from 28 countries and was followed by a webinar on *Working from Home*. We conducted workshops in Latin America, Africa, and Asia based on the Participatory Project Design Toolkit introduced to IEA Council members in 2019 (P<sup>2</sup>DT).

### ***Policy 2. Collaborate with and reinforce networks***

Communication and collaboration with IEA networks took on increased importance as the number of IEA member societies grew, and the IEA leadership focused on networks as a means of reaching and engaging members efficiently. During this term, we approved two new IEA Networks, ACED, or the Asian Council on Ergonomic Design, and BRICS<sub>plus</sub>, a network comprised of Brazil, Russia, India, China, and South America. BRICS<sub>plus</sub> is the first inter-continental IEA Network that is built on mutual interests and priorities rather than geographical region.

### ***Policy 3. Contribute to science, technology, and practice***

Contributions to science, technology, and practice include, first and foremost, the IEA2021 Congress, our world-class vehicle for the dissemination of HF/E knowledge. The diversity of our discipline is highlighted in the 30+ tracks of the technical program. Our webinars and the collaborative projects described in this Triennial Report represent notable contributions to science, technology, and practice. Additionally, IEA annual and triennial awards recognize our members and other stakeholders who have contributed significantly to HF/E science, technology, and practice.

During this term we piloted a new strategy to advance science and practice, as well as a new structure for Executive Committee meetings. The 2019 EC meeting was sponsored by an external stakeholder, ARL SURA, a prominent insurance organization in Latin America, and in return EC members provided presentations on HF/E to SURA employees in multiple Colombian cities. We developed connections between SURA and faculty at Universidad del Valle, where a PhD program in HF/E was in the development stage. Together we proposed to build a research group to examine HF/E-related problems encountered by companies in Latin America.

**Policy 4. Identify the roles of IEA in promoting education, certification, and professional standards**

The IEA.cc website now contains an amazing interactive map of educational HF/E programs around the world, with links to program and faculty websites. The map is a first step in identifying existing levels and types of programs and associated coursework to prepare HF/E graduates for research and practice. The Core Competencies, professional standards for HF/E practitioners, were revised and updated during this term. Two new HF/E certification programs were approved for IEA endorsement, and others' endorsements were renewed after review. Standardization of educational programs and cross-regional acceptance of certification status remain on the IEA agenda for future efforts.

**Policy 5. Strengthen relationships with external partners**

During this term IEA greatly strengthened our connections with external partners via Memoranda of Understanding and joint projects involving IEA leadership and IEA members. These connections enhance the role of IEA as the knowledge base and international representative of human factors/ergonomics scientists and practitioners and enable collaboration with organizations whose primary focus may not be HF/E but for whom HF/E is essential component to their purpose and mission. In turn the connections promote our science and discipline in joint conferences and meetings that otherwise would not include recognition of HF/E, and enable us to contribute widely to science, technology, and practice. In addition to long-standing MOUs with the International Occupational Hygiene Association (IOHA) and the International Commission on Occupational Health (ICOH), IEA has new collaborative MOUs with the International Society for Quality in Health Care (ISQua), the Foundation for Professional Ergonomists (FPE), the Institute of Industrial and Systems Engineers (IISE) and their Applied Ergonomics Society (AES), and International Council on Systems Engineering (INCOSE).

IEA initiated several collaborative projects with two United Nations agencies with whom we have Non-Governmental Organization status. IEA produced for the International Labour Organization (ILO) a draft document *Principles and Guidelines for the Design and Management of Work Systems* (available on IEA.cc). This project enabled us to engage an international panel of IEA members as writers and reviewer and enhanced not only their reputations as experts in the field but also the visibility and critical importance of HF/E in the design of work systems. The ILO asked IEA to follow up with a report to serve as the basis of an ILO Convention, or international standard of practice, and we are doing this. We also presented the role of HF/E in patient safety at the World Health Organization Global Summit on Patient Safety and wrote the HF/E sections on the WHO Global Patient Safety Action Plan. We are accomplishing another collaborative project with WHO and an international team of expert writers and reviewers - a guidelines document, *Applying HF/E in Health Care to Patient Safety* and accompanying illustrative case studies. These invited collaborations with UN agencies demonstrate a recognition of the importance and criticality of HF/E across domains and for applications.

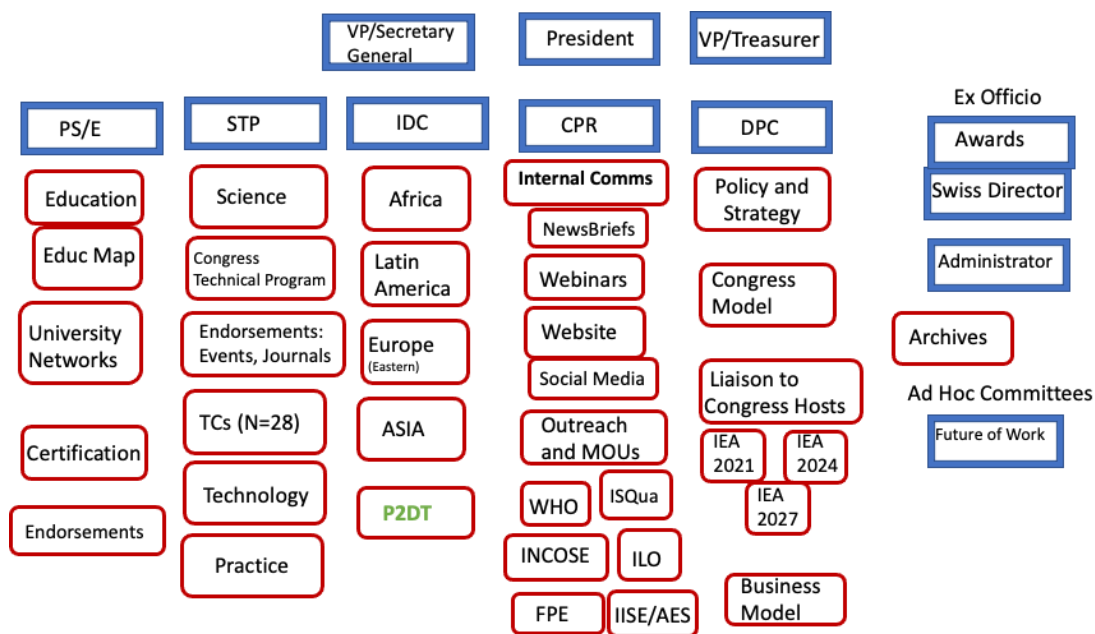
**Policy 6. Reinforce the infrastructure of IEA**

During this term we adopted new financial software to better track our operations, updated and re-created the IEA.cc website, our primary window for internal and external stakeholders, and procured Zoom meeting and webinar software for internal meetings and international webinars.

Although the Triennial Congress is essential to the IEA mission and goals and to our financial sustainability, many components of bidding to host the conference, managing the preparation and conduct of the congress, and interacting with several Executive Committees were not well described for prospective host societies – or were not documented at all. During this term EC members drafted a Congress Model interactive document, designed to facilitate the processes of proposing and

hosting an IEA Congress. This interactive document will be an invaluable aid for both EC and Society leaders and should promote positive outcomes for future Triennial Congresses.

We signed a frame agreement with Springer Publishing to produce indexed electronic Proceedings for our Triennial Congresses and society conferences, as well as any other IEA publications as desired. An important component of our functioning and growth as a global federation of HF/E societies is preserving our history, so we are creating digital archives of all records and documents to complement and eventually replace the paper archives at CNAM in Paris, France. During this term we worked to define the inter-relationships among our Standing Committees and various activities and areas of responsibility. As you can see in the draft organizational chart below, the infrastructure of IEA is quite complex and each new partner, project, and improvement increases the complexity.



**Policy 7. Maintain a future focus for HF/E**

IEA’s future focus is clear in activities such as the creation of a Future of Work Task Force as well as the IEA/ILO draft document on the design and management of work systems. Our collaborations with ILO and WHO focus on defining the role and requirements for HF/E in work systems and health care of the future. IEA served on the Advisory Committee of beyondwork2020, the seminal European Conference on Labour Research. IEA2021 provides a bridge to the future by highlighting cutting-edge research in new areas. We must look to the future to ensure the role and relevance of Human Factors/Ergonomics as an essential science and discipline.

You will note in this report that the terms and acronyms human factors/ergonomics, ergonomics/human factors – HF/E or E/HF – are typically used as a unit. The definition of ergonomics, or human factors, was formally designated and published during the 1997-2000 term when the Organizer of IEA2021, Ian Noy, was the President of IEA. It is noted on our website that the terms and acronyms for human factors and ergonomics are often used interchangeably. The IEA has informally adopted a practice of using both terms or acronyms to indicate the breadth and diversity of our discipline.

**Notes on the Pandemic.**

This has been an extraordinary time to serve as IEA President. The role of Human Factors/Ergonomics has never been more essential than it is today, as highlighted by the COVID-19 pandemic. I am pleased and honored to report that members of IEA - Executive Committee, IEA Council, and member societies - met the challenges of COVID-19 with adaptability, creativity,

flexibility, and a positive, problem-solving attitude. Our revised IEA.cc website served as a central repository for HF/E guidance and solutions from our member societies on a wide range of COVID-related topics including donning and using Personal Protection Equipment, designing and manufacturing ventilators, reducing stress, disaster management logistics, vaccination programs, keeping healthcare workers and patients safe, using computers and devices, and issues involved in remote work. Together we provided a wealth of information for stakeholders across the globe.

Documents addressing COVID-19 issues include the *IEA/ISQua Collaborative Supplement on HF/E issues and contributions to COVID-19*, a project accomplished jointly with the International Society for Quality in Health Care. We facilitated the translation of the Japanese Ergonomics Society's *Seven Practical Tips for Teleworking/Home-Learning using Tablet/Smartphone Devices* into more than half a dozen languages. EC members wrote two documents for the ILO World Day for Safety and Health at Work, *Work at the Sharp End: Human Factors/Ergonomics for Protecting Healthcare Workers and Patients*, and *Work from Home: Human Factors/Ergonomics Considerations for Teleworking*.

Because of COVID-19 restrictions the IEA Executive Committee was called upon to make many adjustments to our usual practices, and we had to find ways to continue work and fulfill our mission and goals within the constraints imposed by the virus. The new 'socially distanced' virtual mode had downsides and benefits. On the negative side, we were not able to continue the in-person working meetings that enabled concentrated reporting, discussions, and planning among the Officers, Executive Committee and Council members. We sorely missed these interactions. We were not able to send representatives to human factors/ergonomics or other conferences to establish new relationships and strengthen old ones. However, we were able to take advantage of the positive aspects of remote work, including the capabilities of Constant Contact and Zoom, to build and increase our communications and collaborative activities. We met frequently and regularly. We discovered that virtual meetings can be highly inclusive – for example the number of Council members who attended the 2020 virtual Council meeting was higher than most in-person meetings, and for some society representatives it was the first time they were able to attend an IEA Council meeting. IEA2021 is perhaps our most visible response to the challenge of COVID-19, as all of us can appreciate the adept pivot of the Congress from an in-person meeting Vancouver, Canada, to a virtual global event. Virtual meetings are now a cost-effective and integral part of our infrastructure. However, they can never completely replace the face-to-face interactions with our friends and colleagues. I hope we will be able to be together soon.

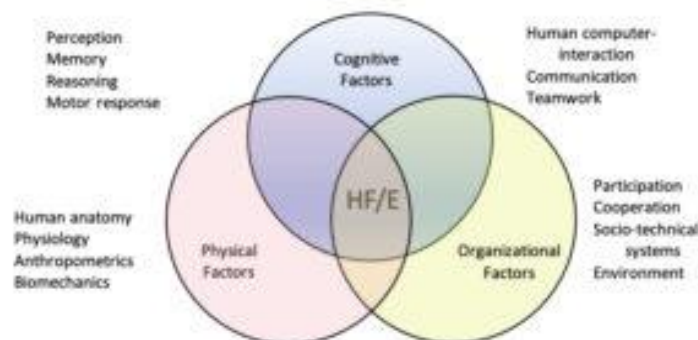
Lastly, I am honored to have been the 20th IEA President during these unique times and to have served with such an excellent Executive team. I am vastly grateful for their hard work and want to recognize them: Sara Albolino, Vice President/ Secretary General; Jose Orlando Gomes, Vice President/ Treasurer; Yushi Fujita, Past President and Awards Committee; Andrew Todd, International Development Committee; Michelle Robertson, Communications and Public Relations Committee; Max Chang, Professional Standards and Education Committee; Thomas Alexander, Science, Technology and Practice Committee; Elina Parviainen, Development and Promotions Committee; Margaret Graf, Swiss Resident Director and Chair of the Certification Subcommittee; Juan Carlos Hiba, Future of Work Task Force; and Ian Noy, Chair of the IEA2021 Organizing Committee. Two EC members stepped down during this term: Ernst Koningsveld, IEA Historian, who led the creation and publication of the *History of the International Ergonomics Association 1985-2018*; and Takashi Kawai, ICT Director, who managed our previous website and supported its re-creation. Lynn Strother, our Administrator, is not an official member of the Executive Committee, but she was and is invaluable to the smooth and efficient functioning of the IEA EC and our interactions with our Members. Thank you to all EC members for their extraordinary efforts, described in their respective sections here and in the Triennial Report. It has been a rewarding and invaluable experience to work with these extraordinary people.

## 2. About the discipline of human factors/ergonomics

### 2.1. Definition and applications

The word *ergonomics* — “the science of work” is derived from the Greek *ergon* (work) and *nomos* (laws). Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance. The terms *ergonomics* and *human factors* are often used interchangeably or as a unit (e.g., human factors/ergonomics – HF/E or E/HF), a practice that is adopted by the IEA.

Although HF/E practitioners often work within particular economic sectors, industries, or application fields, the science and practice of HF/E is not domain-specific. HF/E is a multi-disciplinary, user-centric integrating science. The issues HF/E addresses are typically systemic in nature; thus HF/E uses a holistic, systems approach to apply theory, principles, and data from many relevant disciplines to the design and evaluation of tasks, jobs, products, environments, and systems. HF/E takes into account physical, cognitive, sociotechnical, organizational, environmental and other relevant factors, as well as the complex interactions between the human and other humans, the environment, tools, products, equipment, and technology.



In order to practice effectively, human factors/ergonomics professionals who are specialists in a given domain or discipline must address issues and challenges with sufficient consideration of all of the relevant elements of HF/E. This assumes a broad understanding of other HF/E areas; however, actual problem solving requires participatory approaches through consultation with HF/E specialists in different domains as well as specialists in other relevant fields.

#### Participation in system design

HF/E contributes to safe and sustainable systems through a unique combination of three drivers for intervention:

- (1) HF/E takes a systems approach, using a systematic, iterative, step-by-step process;
- (2) HF/E is design-driven; and
- (3) HF/E focuses on optimizing two closely related outcomes, performance and well-being.<sup>3</sup>

HF/E practitioners recognize the need for participation of all stakeholder groups (*participatory human factors/ergonomics*) in system design. Effective HF/E is indispensable to support our life and work in the 21st century; without attention to HF/E, system design will not support the sustainability of work, organizations, or societies.

## 2.2 Stakeholders of HF/E

Any person or group of people that can affect, be affected, or perceive themselves to be affected by a HF/E decision or activity is a stakeholder of HF/E. Stakeholders are inter-related and include:

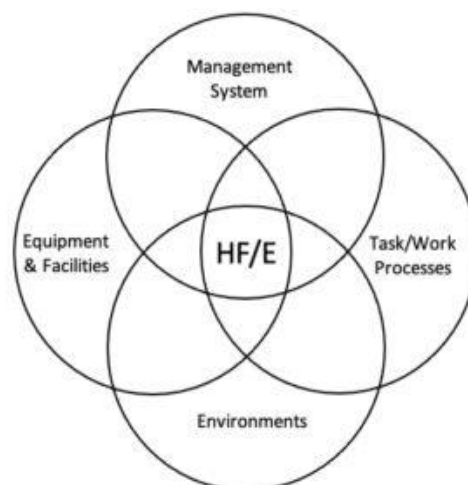
- System influencers – e.g., competent authorities such as governments, regulators, standardization organizations at national and regional levels.
- System decision makers – e.g., employers and managers, those who make decisions about requirements for the system design, purchasing system, implementation and use;
- System experts – e.g., professional HF/E specialists, professional engineers and psychologists who contribute to the design of systems based on their specific professional backgrounds;
- System actors – e.g., employees/workers, product/service users, who are part of the system and who are directly or indirectly affected by its design and who, directly or indirectly, affect its performance.<sup>5</sup>

Stakeholders for HF/E can represent many levels, domains, and types of influence and investment, such as:

- International level – regulatory officials and policy makers, International NGOs
- National level – government, law and policy makers, regulators, national NGOs
- Educational level – universities, applied sciences programs, vocational education, professors, teachers, students
- Practice level – CEOs and managers in companies, designers of work and work systems in different fields, practitioners in domains relevant to HF/E.

## 2.3 Value of HF/E in the world of work

Work systems are made up of humans, the tools, processes, and technologies they use, and the work environment. HF/E contributes to the creation of safe and sustainable work systems by considering the interrelatedness of human, technical, and environmental components and the potential effects of work system design changes on all parts of the system. Members of the HF/E community recognize the need for participation of all stakeholder in system design groups (i.e., Participatory HF/E).





HF/E simultaneously contributes to the economic health of organizations by enhancing worker wellbeing, capability and sustainability, maximizing performance, and reducing direct costs as well as indirect costs from productivity losses, quality deficiencies, and employee turnover. Workplaces that are designed with HF/E principles have better employee performance and produce better business results. HF/E design in work systems is simply and unquestionably good business.<sup>6</sup>

### **Resources cited:**

Bridger, R. S. (2018). *Introduction to Human Factors and Ergonomics, 4<sup>th</sup> Edition*. Boca Raton, FL, USA. CRC Press.

Read, G.J.M., Salmon, P.M., Goode, N., & Lenné, M.G. (2018). A sociotechnical design toolkit for bridging the gap between systems-based analyses and system design. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 28(6), 327-341.

*Principles and Guidelines for HF/E Design and Management of Work Systems*. (2019) Joint Document by IEA and the International Labour Organization (ILO).

Wilson, J. R. (2014). Fundamentals of systems of ergonomics/human factors. *Applied Ergonomics* (45), 5-13.

Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., Wilson, J. R., & van der Doelen, B. (2012). A strategy for human factors/ergonomics: Developing the discipline and profession, *Ergonomics*, 55:4, 377-395, DOI: [10.1080/00140139.2012.661087](https://doi.org/10.1080/00140139.2012.661087)

Hendrick, H. W. (2003). Determining the cost-benefits of ergonomics projects and factors that lead to their success. *Applied Ergonomics*, 34, 419-427.3. About IEA

### **3.1. Birth and development of IEA**

The International Ergonomics Association was founded in 1959. At the time, only three human factors/ergonomics (HF/E) societies were operating (in the United Kingdom, the USA, and Germany). Members of IEA were not societies, but individuals. In 1976, due to the growing number of national or regional societies on one hand and to the desire to be able to interact with world organizations such as the World Health Organization (WHO) and the International Labour Organization (ILO) on the other, IEA decided to become a federation of societies.

Since then, the history of IEA and of human factors/ergonomics has been a story of expansion—first in terms of the number of Federated Societies (from 11 in 1976 to 52 in 2021) and of the number of individuals belonging to member societies (11,689 in 1976 to an estimated 15,000 currently).

Expansion has also occurred in terms of scope of interests. The range of topics covered by the Triennial Congresses now includes healthcare, organizational design and management, manufacturing, standards, human reliability, product design, aging, agriculture, rehabilitation, and more. Attendance has grown (120 participants in 1961, 519 in 1976, 1600 in 1997, 3100 in 2000, and 1576 in 2018). Variations in attendance at IEA Congresses are influenced by their location in the world and by global events at the time, including pandemics, wars, and global financial crises.

Finally, expansion has occurred in the integration of human factors/ergonomics into society. Today HF/E is not only an academic discipline, it is also a profession. This has led to the development of professional certification systems in HF/E and of training programs in the discipline.

The International Ergonomics Association is now a mature organization, with responsibilities at a global level. IEA is a federation of ergonomics and human factors societies around the world. IEA's mission is to elaborate and advance human factors/ergonomics science and practice, and to improve the quality of life by expanding its scope of application and contribution to society. IEA interacts with

like-minded organizations such as WHO, ICOH, ISQua, and ILO for specific activities, such as developing and implementing HF/E programs in small- and medium-size companies in manufacturing and in agriculture. Special emphasis has been given to developing countries in Africa, Asia, and South America.

IEA was re-registered in Zurich, Switzerland in 2009 as an international not-for-profit organization. However, the requirement to register the bylaws in German created an administrative difficulty, given that English is the working language of the IEA. In 2017, registration was moved to Geneva, Switzerland, and a Swiss resident maintains the ex-officio position of IEA Director. The paper IEA Archives are hosted by CNAM in Paris, France, and the digital archives are on our website server.

### **3.2. IEA Governance**

IEA is an international not-for-profit organization, governed by a Council of representatives from the Federated Societies. Day-to-day administration is performed by the Executive Committee, which consists of the elected IEA Officers, Chairs of the Standing Committees, and Chair(s) of the next IEA Congress.

A President, Vice President/Secretary General, and Vice President/Treasurer are elected by Council at the Triennial Congress to serve for a period of three years. Standing Committee Chairs are appointed by the IEA President. The President may also create ad hoc committees or task forces to address specific issues or problems. The officers and members of the Executive Committee are volunteers, and no monetary benefits are given to them. This means that 100% of IEA funds support the implementation of IEA's mission and goals.

The governing body of the IEA is the Council. The Council makes all major decisions concerning the IEA, including changes to Bylaws and Operating Procedures, general policy, activities, admissions, election of officers, and budget. The Council admits all new members of IEA in any category and may terminate membership for good cause. The Council consists of representatives of Federated Societies and elected officers of the IEA. Only these individuals have the right to vote.

The IEA Executive Committee is led by the IEA President, Vice President/Secretary General, and Vice President/Treasurer. The officers are responsible for the management of IEA affairs, in accordance with the IEA's mission and goals.

The main responsibilities of the officers are:

#### **President**

- Represents the IEA
- Chairs Council and Executive Committee meetings
- Forms new committees and restructures existing ones
- Appoints chairs to committees
- Oversees the work of committees

#### **Vice President/Secretary General**

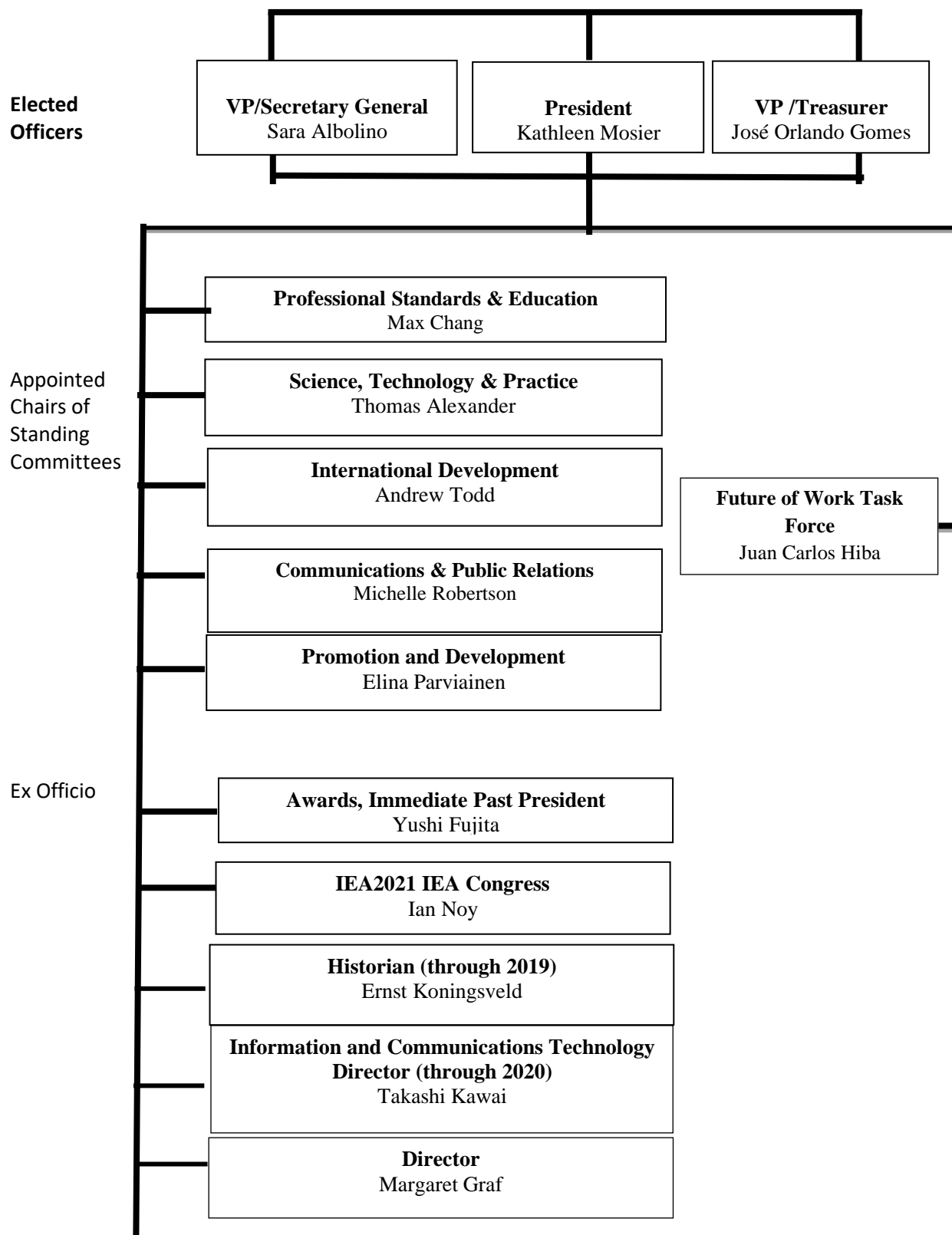
- Provides day-to-day administration of the IEA, including communication and documentation responsibilities
- May also assist in other tasks as a Vice President at the discretion of the President
- Has the final responsibility for the IEA website

**Vice President/Treasurer**

- Is responsible for the accounting of IEA funds
- Conducts budget analysis and projections
- Provides financial management
- Establishes new sources of revenue
- May also assist in other tasks as a Vice President at the discretion of the President

### 3.3. IEA Executive Committee

#### IEA Executive Committee 2018 - 2021



### 3.4. IEA Standing Committees

The Standing Committees accomplish much of the work of IEA. In turn, their subcommittees are responsible for specific functions or activities. More information is contained in the committee reports in Section 7.

**Professional Standards and Education.** The IEA Professional Standards and Education (PSE) Standing Committee compiles and disseminates information relevant to offerings in ergonomics at educational institutions and educational materials, including instructional methods, aids, and standards. Goals include the development of internationally accepted guidelines for endorsement of human factors/ergonomics certification programs, including guidelines for curricula to satisfy IEA Core Competency Standards. This committee also explores strategies to enhance support of human factors/ergonomics education programs.

**Science, Technology, and Practice.** The IEA Science, Technology, and Practice (STP) Standing Committee coordinates the exchange of scientific and technical information at the international level. STP undertakes its activities in cooperation with 27 Technical Committees (as of June 2021) that address specific areas of human factors/ergonomics interest. The committee supports the organization of scientific and technical events and reviews applications for IEA endorsement and sponsorship of scientific events and publications. STP assists in the planning of the IEA Triennial Congress scientific program. STP may also assist industrially developing countries in the assimilation of ergonomics and human factors knowledge and practice.

**International Development.** The International Development (ID) Standing Committee promotes, coordinates, and implements human factors/ergonomics activities in industrially developing countries. ID supports local and regional initiatives concerning research, development, training, and conferences. The committee may implement HF/E development programs in industrially developing countries to improve working conditions and to support, encourage, and collaborate with other IEA committees with interests in industrially developing countries.

**Communications and Public Relations.** The Communications and Public Relations (CPR) Standing Committee is responsible for outreach to internal and external stakeholders. It promotes MOUs and collaborations with like-minded organizations and may produce human factors/ergonomics guidelines and promotional brochures. The committee also coordinates dissemination of proceedings of IEA-endorsed conferences and donations of educational materials to libraries in industrially developing countries.

**Awards.** The Awards Standing Committee manages the awards process, whereby IEA recognizes individuals for their contributions to the field. Awards for which this committee is responsible include:

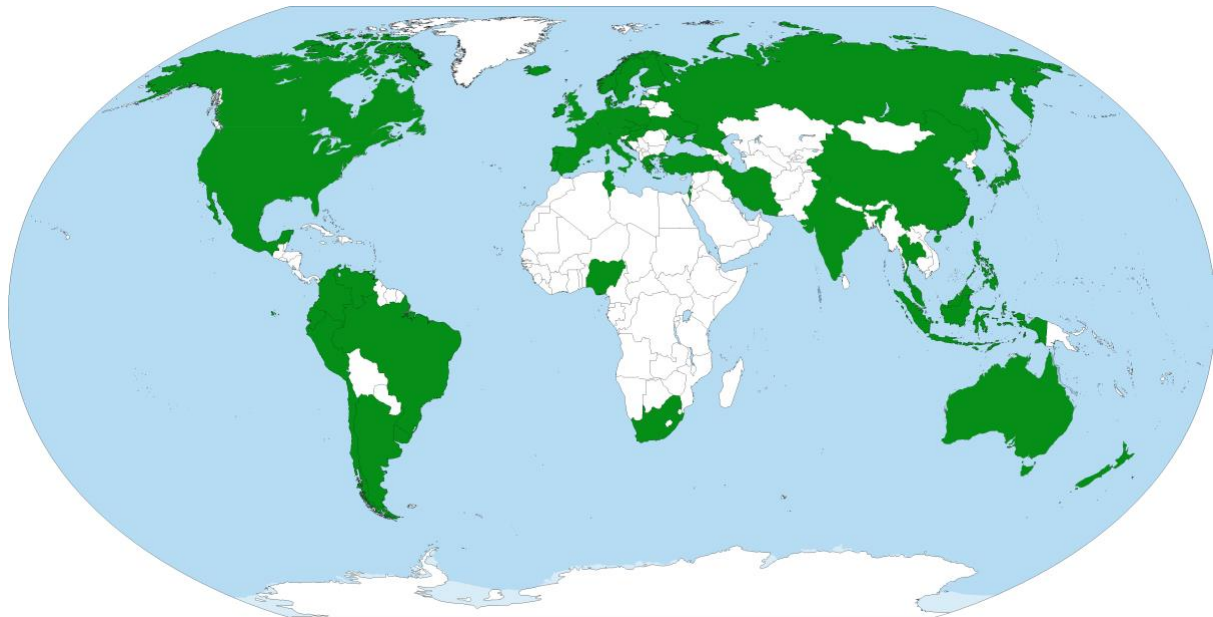
- IEA Fellow Award
- IEA Distinguished Service Award
- IEA Outstanding Educators Award

- IEA Award for Promotion of Ergonomics in Industrially Developing Countries
- IEA Ergonomics Development Award
- IEA/Elsevier John Wilson Award
- IEA Human Factors and Ergonomics Prize
- IEA K. U. Smith Student Award
- IEA/Tsinghua Award
- IEA/Kingfar Award
- IEA President's Award

Development and Promotion. The Development and Promotion (DP) Standing Committee explores and coordinates new policy options and proposals and assists in the development and implementation of new programs and initiatives relevant to the functioning and effectiveness of IEA. The committee develops and coordinates plans and proposals concerning IEA policies, operation, and structure, and assists in development of policy recommendations to better serve Federated Societies and the international human factors/ergonomics community.

## 4. IEA Membership

As of May 2021, the International Ergonomics Association had 52 Federated Societies, 2 Affiliated Societies, 6 IEA Networks, 8 Sustaining Member organizations, and 10 individual Sustaining Members. The map below shows areas with Federated Societies and Affiliated Societies. [Note that Japan and Colombia have both a Federated Society and an Affiliated Society.]



**Figure 4.1. Map of the world showing countries with IEA Federated Societies in green. Note that Japan and Colombia have both an IEA Federated Society and an Affiliated Society.**

### 4.1. IEA Federated Societies

Federated Societies are professional societies that have the main aim of promoting and disseminating human factors/ergonomics and human factors knowledge and practice. They have been admitted by the Council for having met and continuing to fulfil the eligibility criteria provided in the IEA By-Laws. They are bodies that elect a governing council from within their own membership and encourage the publication of research material and the development of human factors/ergonomics practice. They have voting rights and appoint representatives to Council based on the size of their membership. During the 2018-2021 term, Nigeria was reclassified from an Affiliated Society to a Federated Society.

Countries with IEA Federated Societies are:

Argentina	Malaysia
Australia	Mexico
Austria	Netherlands
Belgium	New Zealand
Brazil	Nigeria
Canada	Nordic Countries
Chile	Peru
China	Philippines
Colombia	Poland
Croatia	Portugal
Czech Republic	Republic of Korea
Ecuador	Russia
French Language Ergonomics Society	Serbia
Germany	Singapore
Greece	Slovakia
Hong Kong	South Africa
Hungary	Spain
India	Switzerland
Indonesia	Taiwan
Iran	Thailand
Ireland	Tunisia
Israel	Turkey
Italy	Ukraine
Japan	United Kingdom
Latvia	Uruguay
	United States of America
	Venezuela

#### **4.2. IEA Affiliated Societies**

Affiliated Societies are other national or international professional societies that are ineligible for federated member status or have an interest in human factors/ergonomics but have their main purpose in an associated area. The current IEA Affiliated Societies are:

Colombia (CARE – Colombian Association of Researchers on Ergonomics)

Japan (Human Ergology Society)

#### **4.3. IEA Networks**

IEA's growing size has led to a revision of its membership structure, through the creation of IEA Networks. IEA Federated Societies may work together in networks when a need is felt to do so. Examples of such needs can be geographical proximity, sharing of a common language, or promotion of common interests. The IEA Council gives its agreement to the creation of a network on the basis of a proposal from networked societies stating membership and goals. These networked societies are granted the status of IEA Network and report on their activities to IEA.

There are currently six IEA Networks:

(1) Asian Council on Ergonomics and Design



- (2) ErgoAfrica
- (3) Federation of Brazilian, Russian, Indian, Chinese, and South African Human Factors and Ergonomics Societies—BRICS<sub>plus</sub>
- (4) Federation of European Ergonomics Societies – FEES
- (5) La Unión Latinoamericana de Ergonomía – ULAERGO
- (6) South East Asian Network of Ergonomics Societies – SEANES

#### **4.4. IEA Sustaining Members**

Academics and practitioners accomplish the work of the IEA; however, many initiatives vital for the development of ergonomics and human factors as a unique science and profession cannot be funded with existing resources. Funds are thus needed to support the development of human factors/ergonomics worldwide, including in industrially developing countries. Funds are also required to disseminate HF/E knowledge to industry and to society at large, to promote HF/E education and competency standards, and to support the work of IEA Technical Committees.

The IEA Sustaining Membership program supports the science and application of human factors/ergonomics worldwide. The program provides exposure and enhances the image of institutional members.

##### **4.4.1. Organizational Sustaining Members**

There are four levels of support for Organizational Sustaining Membership, and each level offers specific benefits. Sustaining Membership is typically granted on a three-year basis. The granting of IEA Sustaining Membership does not imply IEA endorsement or approval of an organization or company's products or services.

##### **Diamond Level - US \$10,000 per year**

- **Elsevier**  
Timo Bazuin, Representative  
United Kingdom

##### **Platinum Level- US \$5,000 per year**

- **TeamScape LLC**  
USA

##### **Gold Level - US \$1,000 per year**

- **Korea Occupational Safety & Health Agency (KOSHA)**  
Doo Yong Park, President  
Republic of Korea

##### ***Organizational Sustaining Membership Benefits***

**Gold level**                      **US \$1,000/year**

**Individual members**      **US \$200/year**

- Listings on the IEA website
- Complimentary copy of quarterly updates from the IEA President to the Federated Societies.
- Sustaining Member Plaque with company name inscribed

**Platinum level**              **US \$5,000/year**

- All benefits at the Gold level
- Official listings in the programs of IEA conferences and congresses
- Two complimentary registrations for the forthcoming IEA Congress
- Company logo on IEA website home page with active links

**Diamond level                    US \$10,000/year**

- All benefits at the Platinum level
- Complimentary space at exhibitions organized at IEA Congresses, subject to approval by Congress organizer
- Exposure of company logo at IEA conferences and Congresses
- Direct links between new company products with relevant sections of the IEA website
- Other benefits, such as a speech by an IEA Officer, can be negotiated

**Star level                            US \$25,000/year**

- All benefits at the Diamond level
- Additional three complimentary registration for the next IEA Congress
- Acknowledgments on the first page (covers) of the Congress proceedings
- Free distribution of promotional materials at IEA Congress
- Additional benefits can be negotiated

**4.4.2 Individual Sustaining Members**

Individual Sustaining Members are individuals who voluntarily support IEA through annual contributions, which can be allocated to specific activities or uses as determined by the Executive Committee.

There are three levels of membership for Individual Sustaining Members:

- Contributor (annual contribution of US \$200)
- Supporter (annual contribution of US \$500)
- Benefactor (annual contribution of US \$1,000 and above)

**Supporter**

- **David Caple**
- **Nancy Daraiseh**

**Contributor**

- **Pascale Carayon**
- **Peter Hoonnakker**
- **Andrew S. Imada**
- **Kazutaka Kogi**
- **Ernst Koningsveld**
- **Peter Lachman**
- **Johan Molenbroek**
- **David Rempel**

#### **4.4.2 Technical Committees**

Technical Committees (TCs) are ad hoc groups that are formed as a platform to discuss and exchange up-to-date information on a particular ergonomics and human factors field. As of May 2021, IEA has 27 TCs:

1. Activity Theories for Work Analysis and Design
2. Aerospace HF/E
3. Affective Product Design
4. Aging
5. Agriculture
6. Anthropometry
7. Auditory Ergonomics
8. Building and Construction
9. Digital Human Modeling and Simulation
10. Ergonomics for Children and Educational Environments
11. Ergonomics in Advanced Imaging
12. Ergonomics in Design for All (EinDfA)
13. Ergonomics in Manufacturing
14. Gender and Work
15. Healthcare Ergonomics
16. Human Factors in Robotics
17. Human Factors and Sustainable Development
18. Mining
19. Musculoskeletal Disorders
20. Organizational Design and Management
21. Process Control
22. Psychophysiology in Ergonomics
23. Safety and Health
24. Slips, Trips, and Falls
25. Transport Ergonomics and Human Factors (TEHF)
26. Visual Ergonomics
27. Work with Computing Systems (WWCS)

## 5. External Organizations and Liaisons

**Michelle Robertson, Chair, Communications and Public Relations Committee**  
**Sara Albolino, Vice President and Secretary General**

IEA has two interrelated primary goals that define our global mission:

- To advance the science and practice of human factors/ergonomics at an international level; and
- To enhance the contribution of the human factors/ergonomics discipline to global society.

Interacting with prominent international and national organizations is one way to promote the awareness of IEA and the science of human factors/ergonomics on a global basis. IEA has several well-established formal relationships with leading international non-governmental organizations (NGOs), as well as with the International Organization for Standardization (ISO). New collaborations with related scientific professional societies are emerging and becoming established formally through the exchange of Memoranda of Understanding (MOU). Overall, the goals of these relationships are to encourage and support the participation in each other's conferences, to collaborate on joint projects, to stimulate communication among the organizations through respective websites, seminars, and workshops, and to consider establishing either a formal liaison position or an MOU for collaboration. The following is an overview of IEA external organizational relationships and descriptions of joint activities and future directions.

### 5.1. Non-Governmental Organizations (NGOs): UN, ILO, and WHO

IEA is formally registered by the United Nations (UN), World Health Organization (WHO) and the International Labour Organization (ILO) as a Non-Governmental Organization (NGO). There is a close liaison among these world bodies, and specific activities are being undertaken and established.

WHO formally recognizes a Non-State Actor representative from the IEA and invites representatives to attend both the WHO Executive Director Board meeting and the World Health Assembly, held in the World Health Headquarters and the Palais des Nations (United Nations), respectively, in Geneva, Switzerland. The 2016-2017 official WHO/IEA collaboration plan included: (1) develop and implement healthy workplace training modules and guidance materials; (2) provide website information on validated tools for assessing risk of work-related musculoskeletal injuries and disorders (WMSDs); and (3) contribute to a WHO Working Group developing WHO Guidelines on Minimum Standards for Workplace Health Protection.

IEA has a three-year plan of activities with the WHO technical division on patient safety (2020-2022). IEA, WHO, and the WHO Collaborating Centre for Human Factors and Communication for the delivery of safe care (Centro Gestione Rischio Clinico e sicurezza del paziente), are jointly creating a document *Applying HF/E to Health Care for Patient Safety*, and also collecting relevant case studies to supplement the document.

VPSG Sara Albolino participated in the Global Consultation on Patient Safety held at WHO Headquarters (Geneva, Switzerland) in February, 2020, together with IEA President Kathleen Mosier. IEA participated in Global Patient Safety Day by soliciting case studies on HF/E contributions to patient safety. VPSG Sara Albolino is part of the WHO Steering Committee for the preparation of this event annually.

#### ***Collaborative Activities***

Activities to address the first objective included the translation and implementation of Ergonomic Checkpoints documents in collaboration with ILO. Historically, the major collaborative relationship

with ILO has been the joint publication of the *Ergonomic Checkpoints (2<sup>nd</sup> edition)*, and *Ergonomic Checkpoints for Agriculture*, which are posted on both the IEA and ILO websites. The *Ergonomics Checkpoints (v1 and v2)* have been translated into more than 16 languages, including recent translation into Chinese. In addition, the promotion and implementation of these checkpoints occurred through various training programs targeting high-risk industry sectors in China. IEA and the Human Ergology Society will continue to collaborate in translating these Ergonomic Checkpoints and to coordinate with ILO to post them on their website. Additionally, a new Ergonomic Checkpoints document for service workers is being explored as a collaboration between IEA and ILO.

The second WHO objective was completed by collecting, reviewing, and sharing with ergonomists and OSH practitioners throughout the world the methods, “best” practices and “best experiences” for risk assessment and management of work-related musculoskeletal injuries and disorders (WMSDs), including aspects related to job/task design and to workplace/work tools design. The IEA Musculoskeletal Disorder (MSD) Technical Committee has developed a list of tools published in peer-reviewed scientific journals including (1) reliability and (2) predictive value. Published on the IEA MSD TC website is the information on validated tools for assessing risk of WMSDs. Lastly, the IEA representative participated in a special WHO working group related to workplace health protection. This will be an on-going effort in which the IEA representative will attend and participate in targeted WHO working groups that support the goals of the ILO, WHO, and IEA.

### **Three-Year Plan**

As part of IEA official relations with WHO, a three-year plan (2016-2019) was established. The agreed-upon activities are intended to contribute to the outcome targets in the WHO General Programme of Work for 2014-19. Specifically, to contribute to the *WHO Global Master Plan Priority 7, Global Product 7.1: Guidance and policy options for action by the health sector to improve health and safety of poor informal sector workers*, three activities are being implemented: (1) provide case studies on effective interventions for improving workers’ health in typical informal sector work settings; (2) provide case studies of effective interventions by health service providers regarding the informal workforce – access to health services, equity, and health education; and (3) develop an initiative for a regional product protecting the health of healthcare workers in the Americas.

Collaborating with the IEA Future of HF/E Task Force and the Chartered Institute of Ergonomics and Human Factors (CIEHF) in the United Kingdom, case studies are being solicited at the 2018 IEA Congress. An additional activity addressing Objective (2) is *Ergonomic Checkpoints in Health Care Work*, developed by the Human Ergology Society and collaboratively evaluated with the IEA Healthcare Ergonomics Technical Committee. This document is now published and accessible on both IEA and ILO websites. Promotion and dissemination of these guidelines was launched at the 1st ErgoAfrica Conference, hosted by the Ergonomics Society of South Africa (ESSA). A workshop on workers and patient safety was given by the Centre for Clinical Risk Management and Patient Safety of the Tuscany Region, WHO Collaborating Centre. Additionally, an MOU was developed between the WHO collaborating Centre for Patient Safety and Clinical Risk Management and ErgoAfrica (WHO-Regional Branch Office) focusing on the development of ergonomics in healthcare in Africa. Additionally, a triparty MOU was developed among IEA, the WHO collaborating Centre for Patient Safety and Clinical Risk Management, and the International Society for Quality in Health Care (ISQua). Their mutual goal is to promote and exchange information on projects and activities through various communication modes (e.g., conferences, newsletters, and webinars) to further their joint and individual aims.

Additional joint efforts concern the International Commission on Occupational Health (ICOH), and the International Occupational Hygiene Association (IOHA). Non-State Actors (NSAs) from IEA, ICOH, and IOHA attended the 71st World Health Assembly (WHA). This promoted the acceptance of

extending the WHO Global Action Plan on Workers' Health to include healthcare work. ICOH, IOHA and IEA have a triparty MOU based on their similar and complementary organizational missions and goals. The three NSAs prepared for WHO Committee discussions under the General Program of Work (GPW) a joint statement on the need for continuation of the Global Action Plan on Workers' Health (or respective WHO occupational health programme). The joint statement proposed the inclusion of occupational health into the content of the 13<sup>th</sup> GPW requesting: (1) specialised or basic occupational health services (including occupational hygiene and human factors/ergonomic design services) to cover all working people; (2) that self-employed and informal workers be in line with the WHO strategy on universal health coverage (UHC), and the UN Sustainable Development Goal Number 3. This joint statement was delivered at the World Health Assembly (WHA) Committee A assembly floor and was officially recorded in the minutes of the WHA meeting. Several interventions were proposed for future joint actions lending our joint support of the planning, design, maintenance, and construction of safe and effective facilities using evidence-based principles of occupational health, occupational hygiene, and human factors/ergonomics user-centred design. IEA is developing a Joint Statement on Ergonomics with WHO, ILO, ICOH, and IOHA to continue the collaborative work from the 71<sup>st</sup> WHA meeting as well as planning the co-sponsorship (ICOH and IEA) of the International Prevention of Work-Related Musculoskeletal Disorders Conference in 2019, where these activities support the agreed-upon goals and activities stated in the MOU.

One IEA initiative for a regional product is to promote *Ergonomic Checkpoints in Health Care Work* through a collaborative activity with the World Organization of Family Doctors (WOMA), a WHO non-state actor NGO. They are currently using the Checkpoints document in Latin America and will provide feedback on its applicability and use in the field. Translation of this checklist into Spanish is also being considered, and some local efforts are currently being undertaken.

A new IEA/ILO effort is being fostered by the IEA Task Force on the Future of Work (see section 7.11) in engaging with ILO concerning its "Future of Work That We Want" initiative. ILO and WHO also are creating road maps to address this area. This new IEA Task Force is identifying opportunities to create and disseminate white papers that address the importance of human factors/ergonomics in the ILO global initiative.

Most recently, we published on our website the draft document *IEA/ILO Principles and Guidelines for HF/E Design and Management of Work Systems* (<https://iea.cc/iea-ilo-draft-guidelines-available/>).

Additionally, we published three ILO Think Pieces— invited short articles on topics related to HF/E and COVID-19 issues:

- Mosier, K., & Hiba, J.C. (2019). *The essential contribution of Human Factors/Ergonomics to the future of work we want.*
- Albolino, S., & Mosier, K. (2020). [\*Work at the Sharp End: Human factors/ergonomics for protecting healthcare workers and patients\*](#)
- Robertson, M, & Mosier, K. (2020). [\*Work from home: Human factors/ergonomics considerations for teleworking\*](#)

## **5.2. National and International Organizations for Standardization and Guidelines**

IEA has formal liaisons to TC159 of International Organization for Standardization (ISO). Several experts are involved in both ISO and IEA activities and are serving as liaisons between these organizations, which allows for the exchange of ideas and proposals for new activities for mutual benefit (See Section 7.9). Through representation by the Human Factors and Ergonomics Society of a U.S. representative, or liaison, we also participate in ISO 27501, focusing on the Human-Centred Organization—guidance for managers. The IEA Liaisons for ISO are:

- ISO/TC159 Yushi Fujita
- ISO/TC159/SC Thomas Alexander
- ISO/TC159/SC1/WG5 Ralph Bruder

### 5.3. Professional Societies and Scientific Committees

In addition to the MOUs mentioned previously, an MOU was initiated between the IEA Healthcare Ergonomics Technical Committee and the ICOH Scientific Committee on Occupational Health for Health Care Workers (OH-HCW). Formal and new relations with international professional organizations and scientific bodies, such as the Asian Council on Ergonomics and Design, the Advanced Imaging Society, the World Design Organization, and the Institute of Industrial and Systems Engineers (Applied Ergonomics Branch), are being fostered. Other formal relationships being established through the IEA Industrial Development Standing Committee include the WHO ErgoAfrica Regional office, and the BRICS<sub>plus</sub> (Brazil, Russia, India, China, and South Africa) network (See Section 7.7). Additionally, more than five international conferences for scientists and practitioners were endorsed by IEA, promoting the visibility of IEA and the interdisciplinary field of human factors/ergonomics (see Section 7.8). Dissemination of these conference proceedings will support IDC university libraries (see Section 7.5).

**International Society for Quality in Health Care** – We have an ongoing MOU with ISQua, and IEA collaborated on a Human Factors Supplement, where VPSG Sara Albolino is one of the guest editors, published by the *International Journal for Quality in Health Care* (IJQHC) in 2020. We also have formal agreements for cross promoting events of the two scientific associations.

**BeyondWork 2020** – Kathleen Mosier, IEA President, served on the Advisory Board for this conference. The IEA VPSG, President, and EC members organized several sessions and presentations for the conference on HF/E and work. IEA members were invited to join this free conference virtually by registering at <https://www.beyondwork2020.com/index.html>

### 5.4. Academia and IEA Relationships

IEA is building relationships with several universities through the IEA Networks (see section 4.3) to support educational programs and professional seminars to develop competencies in the interdisciplinary field of ergonomics and human factors. One new notable academic relationship is with the University of Panama (UDELAS), which is establishing a master level program (see section 7.7).

### 5.5. Community and IEA Network Relationships Promoting HF/E practices

Several international connections between IEA networks and affiliates promote and develop human factors/ergonomics practices. MOUs have been signed with the Federation of European Ergonomics Societies (FEES), La Unión Latinoamericana de Ergonomía (ULAERGO), and ErgoAfrica. These MOUs facilitate and coordinate the promotion of human factors/ergonomics in specific regions within the IEA networks (see Section 7.7). A worldwide initiative involving several IEA Federated Societies, Networks, and Affiliates has designated October as Global Ergonomics Month. Local and national events to promote the science and profession of human factors/ergonomics occur around the world during the month of October. FEES designates October as WorldWide Month for human factors/ergonomics and joins the EU-OSHA organization to launch various activities and events during this time (see Section 7.5).

## **6. IEA Strategic Plan 2018-2021**

### **6.1. IEA Mission Statement**

The mission of the IEA is to elaborate and advance human factors/ergonomics science and practice, and to expand its scope of application and contribution to society to improve the quality of life, working closely with its constituent societies and related international organizations.

### **6.2. IEA Goals**

The main goals of the IEA are defined as follows (cf. The IEA By-laws):

- To develop more effective communication and collaboration with Federated Societies.
- To advance the science and practice of ergonomics at an international level.
- To enhance the contribution of the ergonomics discipline to global society

IEA contributes to these goals by the following:

- Setting up working groups and technical committees of volunteers on ergonomics topics.
- Establishing memoranda of understanding with external organizations such as non-governmental organizations and professional associations.
- Collaborating with other international associations such as ILO, WHO, and ISO.
- Promoting the dissemination of knowledge through educational programs and journals, supporting conferences, and stimulating local initiatives.

#### **6.2.1. IEA Sub-goals**

The main goals are decomposed into more detailed sub-goals as shown in Table 6.1. They were first approved at a Council Meeting held in Korea in 2003. Since then, they have been referred to as important guidelines for the administration of IEA.



**Table 6.1 The IEA Sub-goals (2003)**

Goal	Sub-goals	
A: Contribute to the development of Federated Societies	A1: Develop more effective communication and collaboration between and with Federated Societies.	<ol style="list-style-type: none"> <li>1. Facilitate visibility of each member society through the IEA home page and other means of communication</li> <li>2. Facilitate joint events between member societies when this will not conflict with the operations of these societies</li> <li>3. Facilitate the creation of networks of societies</li> <li>4. Support member societies in taking proactive and reactive positions on major public issues and in their use of the media</li> <li>5. Support member societies to disseminate ergonomics knowledge at various levels</li> <li>6. Support participation of the industrially developing countries in IEA activities (e.g., support for travel to conferences)</li> </ol>
	A2: Develop ergonomics societies through the world	<ol style="list-style-type: none"> <li>1. Support the continuing growth of ergonomics in industrially developing countries by training and education</li> <li>2. Provide industrially developing countries with ergonomics knowledge by stimulating the existing IEA mechanisms</li> </ol>
	A3: Improve IEA operational effectiveness	<ol style="list-style-type: none"> <li>1. Develop mechanisms for effectively involving member societies in IEA activities</li> <li>2. Improve communication with member societies</li> <li>3. Facilitate the exchange of views and experiences among the leaders of member societies</li> <li>4. Initiate campaign to increase the numbers of sustaining IEA</li> <li>5. Increase revenues from donations, endowments, and funds when this will not conflict with the operations of member societies (e.g., from international bodies)</li> </ol>
B: Advance the Science and Practice of Ergonomics at an International Level	B1: Stimulate development of the ergonomics discipline	<ol style="list-style-type: none"> <li>1. Define and clarify the field of ergonomics</li> <li>2. Identify and elaborate cultural and economic differences affecting ergonomics science and practice</li> <li>3. Identify future needs for development of ergonomics</li> <li>4. Support and promote specialized conferences and workshops in collaboration with member societies</li> <li>5. Promote IEA publications suited to knowledge dissemination by IEA</li> </ol>
	B2: Enhance the quality of professional practice and education in ergonomics	<ol style="list-style-type: none"> <li>1. Continue to promote a broad view of ergonomics and its aims</li> <li>2. Consider development of procedures for the IEA endorsements of various activities; in particular, journals and books</li> <li>3. Develop international professional standards and guidelines and promote best practices in</li> </ol>

Goal	Sub-goals	
		<p>ergonomics (code of ethics, code of professional practice, etc.)</p> <ol style="list-style-type: none"> <li>4. Encourage educational institutions to offer ergonomics programs consistent with "IEA Core Competencies for Practitioners in Ergonomics" criteria</li> <li>5. Promote sharing of quality ergonomics education programs available on the Internet through the IEA home page</li> <li>6. Develop IEA guidelines for accreditation of ergonomics educational programs</li> <li>7. Maintain the IEA Criteria for Endorsement of Certifying Bodies and implement a system for such endorsement</li> <li>8. Maintain the IEA Core Competencies for Practitioners in Ergonomics</li> <li>9. Maintain and disseminate IEA minimum criteria for the process of certification of an ergonomist</li> <li>10. Show best practices in order to stimulate the growth of ergonomics</li> </ol>
<p>C: Enhance the Contribution of the Ergonomics Discipline to Global Society</p>	<p>C1: Promote recognition of the ergonomics discipline</p>	<ol style="list-style-type: none"> <li>1. Identify specific areas where greater international exchange of information is needed and develop appropriate means for dialogue</li> <li>2. Increase public awareness of the benefits of ergonomics through mass media communications</li> <li>3. Provide information about ergonomics/IEA for listing in international directories and reference publications</li> <li>4. Expand and strengthen links with other international bodies</li> <li>5. Expand and strengthen links with societies working in related fields</li> <li>6. Expand IEA prizes to reward and publicize ergonomics innovations</li> <li>7. Develop more-effective use of IEA conferences to promote added value of ergonomics to society</li> <li>8. Elaborate and promote the benefits of ergonomics to improve the quality of life for individuals, organizations, and society</li> </ol>
	<p>C2: Promote applications of ergonomics in all aspects of life</p>	<ol style="list-style-type: none"> <li>1. Promote ergonomics as a means to improve the quality of human life, work effectiveness, and economic benefits</li> <li>2. Mobilize the ergonomics profession to address major global challenges</li> <li>3. Promote collaboration in ergonomics projects among government and international bodies</li> <li>4. Stimulate the involvement of ergonomics in emerging fields of application (e.g., management sciences and mass communication)</li> <li>5. Support member societies in taking positions on</li> </ol>

Goal	Sub-goals	
		major public issues and in their use of the media 6. Promote ergonomics in geographical regions where particular support is needed 7. Develop program of certification of ergonomic quality in design

### 6.3. IEA Strategic Policies

Based on the understanding of (1) the present situation of the IEA, (2) the general guidelines recommended in the Future of Ergonomics report (FoE)<sup>1,2</sup>, and (3) the IEA goals and sub-goals mentioned in above sections, seven strategic policies were specified to guide priorities, activities, and administration. Officers and standing committee chairs were requested to coordinate their action plans in line with the policies. These policies were created by Past-President Yushi Fujita during the 2015-2018 Executive Committee term and further developed and pursued during this term.

#### (1) Engage Stakeholders

The FoE report identifies HF/E (human factors/ergonomics) as a unique discipline that (1) features a systems approach, (2) is design driven, and (3) focuses on two closely related outcomes, performance and well-being. HF/E has great potential to optimize performance and well-being through design-driven and systems approaches. However, the report recognizes that the potential of HF/E remains under-exploited and points out that this can lead to sub-optimal systems with a number of deficiencies such as quality deficits, reduced efficiency, illness, and dissatisfaction. Among four major reasons for this situation identified in the report, the following are considered particularly important:

- Various stakeholders are not aware of the value of HF/E.
- There is not enough high-quality HF/E because of the absence or limited scope of HF/E application.

The 2012 FoE report concludes the following as basic strategies for improving the situation:

- Strengthen the demand for and the application of high-quality HF/E by (1) enhancing the awareness of stakeholders' need for high-quality HF/E by communicating with specific stakeholders about the value of high-quality HF/E in their own language, (2) build partnership with these stakeholders and their representing organizations, and (3) educate stakeholders to create awareness of high-quality HF/E and its contributions to system design.
- Strengthen the application of high-quality HF/E by (1) promoting the education of HF/E specialists to apply high-quality HF/E, (2) ensure high quality standards off HF/E applications and HF/E specialists, and (3) promote HF/E research excellence at universities and other organizations.

The FoE report contends that international development of HF/E is dependent on gaining a better relationship with various groups of stakeholders. More specifically, it promotes the use of the following development strategy based on the need to facilitate the two important goals identified above:

- Promote the desire for high-quality HF/E specialists to important stakeholders by increasing their awareness through (1) improved communication with stakeholders, (2) education of stakeholders, and (3) development of stakeholder partnerships.
- Educate HF/E specialists to ensure (1) high-quality standards of HF/E applications and specialists, and (2) promotion of HF/E research excellence.

---

<sup>1</sup> : Under the auspice of the Development and Promotion Standing Committee, an ad hoc committee was assembled to examine the field and future directions of human factors and ergonomics. The final committee report was submitted in 2012: Jan Dul and others, "A strategy for Human Factors/Ergonomics: Developing the discipline and profession. The report is downloadable from: [https://www.iea.cc/project/FINAL\\_REPORT\\_Future\\_of\\_Ergonomics\\_Committee\\_A\\_Strategy\\_for\\_Human\\_Factors\\_Ergonomics\\_22\\_January\\_2012.pdf](https://www.iea.cc/project/FINAL_REPORT_Future_of_Ergonomics_Committee_A_Strategy_for_Human_Factors_Ergonomics_22_January_2012.pdf).

<sup>2</sup> : Jan Dul and others (2012) "A strategy for human factors/ergonomics: developing the discipline and profession," Ergonomics, Volume 55, 2012 - Issue 4: <https://www.tandfonline.com/doi/abs/10.1080/00140139.2012.661087>.

In short, engaging and educating various stakeholders is a key. To effectively implement this policy on a global scale, it is considered necessary for IEA to reach out to various stakeholders and present some good cases of HF/E effectiveness. These cases must be designed to show that implementing high standards for HF/E contributes to a positive social reputation through accomplishment of high-quality systemic projects.

## **(2) Collaborate with and Reinforce IEA Networks**

The IEA Networks are groupings of Federated Societies or their affiliates that are formed to address specific needs. The Council approves the formation of an IEA Network based on a formal proposal that is endorsed by participating societies and which states the purpose, organizational structure, and mode of operation of the proposed IEA Network (cf. The IEA By-laws). As of June 2021, there are six IEA Networks, which include Federation of European Ergonomics Societies (FEES), La Unión Latinoamericana de Ergonomía (ULAERGO), The South East Asian Network of Ergonomics Societies (SEANES), ErgoAfrica, BRICS<sub>plus</sub> Network and Asian Council on Ergonomics Design (ACED).

Some topics that are potentially relevant to a region are also common to the individual societies in the region. To handle these topics, it is desirable to engage as many as possible regional stakeholders so that regional needs are better understood and actions better implemented. Networks are considered to serve this role of representing regional needs. It is further considered that networks could work together to handle global topics.

However, for these strategies to work it is necessary to reinforce the IEA networks. There are several benefits of reinforcing the IEA networks. First, IEA coverage needs to be widened in all regions. There are countries where ergonomists and human factors practitioners exist, but their numbers are too small for IEA membership as Federated Societies. Second, networks enable the technical distribution of members to be broadened and removes limitations to certain HF/E disciplines. This is important in order for HF/E to play bigger and more important roles in society. Third, it is desirable for the HF/E community to work more closely with relevant communities. IEA can establish formal relations with international organizations for this purpose. In addition to this international effort, it is desirable for member societies to establish formal relations with external organizations, such as societies and industrial communities of non-HF/E disciplines. This could be done effectively by the IEA Networks.

## **(3) Contribute to Science, Technology, and Practice**

HF/E is an applicational discipline that rests on sound science. It has always been IEA's fundamental role to promote good science. Considering the ever-changing, rapid advancement of technologies that potentially affect people's lives, IEA must continue promoting HF/E research, both science and practice, that is relevant to cutting-edge technologies. To serve this important role proactively, IEA must be a center of cutting-edge information on HF/E science. This may take various forms, such as the publication of guidelines, the promotion of state-of-the-art technologies by Technical Committees, and the discussion of roles that HF/E should play in relation to emerging technologies.

## **(4) Identify the Roles of IEA in Promoting Education, Certification and Professional Standards**

Almost 20 years ago, IEA introduced guidelines for the certification of professional ergonomics and human factors practitioners (typically called *ergonomists*) and began to endorse certification systems that were in line with these guidelines. However, only a few certification systems have been endorsed by IEA, and feedback from societies that had developed certification systems, as well as those currently developing them, indicated that IEA documents were too complex and not well understood. Essentially, the purpose of the endorsement mechanism is to ensure a high standard of HF/E science and practice and also to provide guidance for educational programs to train ergonomists and human factors practitioners. The guidelines include a list of "core competencies"

that describe the required knowledge and skills of a professional ergonomist, as well as other recommendations that must also be followed, such as non-commercially oriented approaches, independence, possibility of independent review, and non-discrimination. To standardize and promote certification, IEA reviewed and updated the certification guidelines and reviewed the core competencies. We also revived a system of regular reviews, to ensure that the practices of the certifying bodies remain in line with IEA guidelines.

Encouraging mutual recognition of certification among countries is recognized as an important topic for giving value to IEA-endorsed certifying systems. Mutual recognition is being practiced at an unofficial level between many IEA-endorsed systems, although very few ergonomists change their country of work. Some certifying bodies are limited in granting recognition to others because of their accreditation standards; however, IEA can play the role of publishing on the IEA website the qualifications from IEA endorsed systems that are deemed to be equivalent. This is an important means of giving value to IEA endorsement and also of improving the maintenance of high standards for professional ergonomists globally.

As a consequence of local needs, several existing certifying bodies are adopting a multi-layered certification system. Certifying bodies that wish to obtain IEA endorsement must have at least one level of certification that meets the level of the core competencies; however, IEA may need to introduce more levels in the endorsement system in the future. IEA must keep up to date with these developments and, if necessary, produce further guidelines, so that the level of qualification of all certified ergonomists remains clear.

#### **(5) Strengthen Relationships with External Partners**

IEA has long and formal relationships with leading international agencies and organizations. IEA is formally registered by United Nations (UN), World Health Organization (WHO), and International Labour Organization (ILO) as a Non-Governmental Organization (NGO). IEA has maintained a triparty MOU with the International Commission on Occupational Health (ICOH) and the International Occupational Hygiene Association (IOHA). IEA has formal liaisons to Technical Committee 159 of the International Organization for Standardization (ISO). These existing relationships require continued effort to maintain their mutual benefit.

When the interdisciplinary nature of HF/E is considered, it is evident that IEA should establish new relationships with more international organizations both inside and outside of the HF/E community. This is a way to enable IEA to promote HF/E tightly coupled with related disciplines. In the past several years, we have established collaborative MOUs with the International Society for Quality in Health Care (ISQua), the Foundation for Professional Ergonomists (FPE), the Institute of Industrial and Systems Engineers (IISE) and their Applied Ergonomics Society (AES), and International Council on Systems Engineering (INCOSE).

#### **(6) Reinforce the Infrastructure of IEA**

For IEA to fully function as an international organization that can exert substantial influence over people and promote recognition that HF/E is an indispensable discipline for our life, IEA must have a sound infrastructure. As a voluntary organization with limited resources, it has been not easy to develop a sound infrastructure. It is one of the most critical problems that IEA is facing. In a previous term, the rule systems (i.e., by-laws and operating procedures) were improved considerably. We added a part-time Administrator to provide continuity and operational support. We converted to a better and more transparent accounting system. But there still remains much room for improvement in almost all aspects, from the legal status through the financial system to the administrative system. To make the IEA more financially and administratively sustainable, the infrastructure must be reinforced.

### **(7) Maintain a Future Focus for HF/E**

The need for a future focus is apparent in the recommendations of the Dul et al. *Future of Ergonomics* report. IEA must be several steps ahead of the trends, issues, challenges, and unanticipated events that will need to be addressed by the HF/E systems approach. Many of these will be tied to the future of work; thus we collaborated with the ILO to provide guidance on HF/E in future work system development and maintenance. During this term, new challenges were precipitated by COVID-19; IEA and member societies had to think in new ways to solve problems associated with PPEs, ventilators, and the vaccination process, and collaborated with WHO to provide guidance on HF/E in health care and patient safety. IEA's future focus is a strategic priority for our association and for HF/E. The use of *HF/E* and *human factors/ergonomics* (rather than simply *ergonomics*) throughout this report is deliberate and future focused. It is a recognition that our successful future requires that we embrace all sides and aspects of our discipline and claim them as our own. This is key to our survival as an association as well as to the advancement of our multi-faceted discipline as a science and profession.

## 7. IEA Activities and Achievements – 2018-2021



### 7.1. Overview

**Sara Albolino, Vice President and Secretary General.**

The remaining sections of this report describe the activities and achievements of the 2018-2021 Executive Committee. In keeping with the seven strategic policies presented above, this EC has striven to be highly proactive and involved with IEA members and the global community. We made positive changes to our infrastructure – including improvements to our financial accounting systems, the IEA.cc website, and our day-to-day administration. We selected outstanding HF/E professionals for recognition via IEA annual and triennial awards. Reports from each of the IEA Standing Committees and one Ad Hoc Committee describe their excellent work and progress over the past three years. Details of the extraordinary and successful IEA2021 are described by the IEA2021 organizers.

But this term has been exceptional and strongly affected by the COVID-19 emergency. In the following paragraph I will summarize the main aspects and changes involved in the pandemic.

In final summary, IEA President Kathleen Mosier discusses where we are as an international association and how we can progress and contribute in the future.

#### 7.1.1 IEA activities at the time of COVID-19

Because of the COVID-19 pandemic this term has been incredibly challenging for IEA, as it has for all international scientific associations and for the entire world. Restrictions on travel and meetings forced us to find new ways for collaborating and accomplishing our goals.

Especially we can emphasize some of the most relevant aspects and related consequences associated with the pandemic:

- **Physical distancing:** In the last two years, all meetings of the Executive Committee and Council have been organized remotely with a reorganization of the voting process and of the formal procedures and a revision of the Operating Procedures document. We also conducted Zoom meetings with EC members and Officers periodically and with IEA2021 organizers and member society representatives as needed. Concerning the Operating Procedures, the main changes are aimed at a better coordination of our activities, especially in case of emergency, which prevent the possibility of conducting our meeting and our decision making processes face-to-face.
- **Challenges for HF/E expertise to be faced:** Many members of the IEA community have been involved as representatives of our association in the technical issues associated with coping with the emergency. In particular, IEA focused in making contributions on the following topics: the design and correct use of PPE, the facing of psychological and physical limitations of working from home, the communication challenges of guaranteeing continuity of information at all levels, and the need for a systemic and resilient approach to reorganize the healthcare system.
- **IEA responses:** Our association produced many factual contributions, such as guidelines for the design and use of PPE, creating podcasts and documents with guidance for working with devices and working from home, collecting and disseminating stories and case studies related to COVID-19 responses through the new website and the new email messaging system, and participating in many webinars to introduce HF/E perspectives into the scientific debate. In the last six months we also started to use our own system for webinars, with the definition of a model based on involving the



Technical Committees and the Federated Societies that can be reproduced for webinars focused on the various technical domains of H/FE.

- **IEA collaboration with WHO, ISQUA and ILO for promoting HF/E during the pandemic:** The IEA approach of creating cultural bridges among different scientific communities in order to develop our HF/E discipline with a global approach, was also an inspiration for collaboration during COVID-19. IEA produced many scientific pieces in collaboration with other international organizations; in particular, with ILO, ISQUA, and WHO.
- **IEA2021 and Congress Model:** The emergency promoted considerations for creating new assets according to the emergency and going totally online.

In the sections on Infrastructure (7.3), I will describe the VPSG main activities with a light on the specifics provoked by the pandemic.

## 7.2 Financial Report

**José Orlando Gomes, Vice President and Treasurer**



### 7.2.1. Overview of accounts

There are three active bank accounts, all of them at UBS in Switzerland—a U.S. Dollar (USD) and a Swiss Francs (CHF) checking account and an investment account in USD. There is also a PayPal account. The accounts that the IEA had at Scotia Bank, the USD checking and the investment accounts in USD and Canadian Dollars, were all closed out in 2019.

- At UBS:
  - USD cash account opened in October 2018 – basic account
  - CHF (Swiss Francs) account opened in October 2018 – basic account
  - USD investment account opened in July 2019
- At PayPal Switzerland:
  - For Federated and Affiliated Societies to transfer small amounts to IEA, avoiding high clearing fees.

Accounting rules are essentially the same as those adopted in previous years. The following summarizes the important rules:

- All final financial numbers are presented in USD. Most financial operations are done in USD. The occasional operations in CHF are booked in their corresponding ledgers. All transactions are consolidated in USD.
- The IEA fiscal year coincides with the calendar year, January 1 through December 31.
- Revenues are noted and booked when received, and expenses are booked when incurred, as accounts payable or paid, as the case may be.
- Membership dues of previous years paid during a year are allocated to the Revenues of that year.
- Membership dues paid for coming years are allocated to the Liabilities.
- The following accounting titles are used.

#### Revenues

- Membership dues (FS and AS combined)
- Sustaining member contributions
- Funds
- Capitation fees
- Miscellaneous

#### Expenditures

- Meetings
- Travel executives (officers and standing committee chairs)
- Office (includes CONSAVO Legal)
- Standing Committees
  - Awards Standing Committee
  - Communications and Public Relations Standing Committee
  - Development and Promotion Standing Committee
  - International Development Standing Committee
  - Professional Standards and Education Standing Committee
  - Science, Technology, and Practice Standing Committee

- Grants
- Seed money
- Bank charges
- Website
- Miscellaneous

PayPal is used to avoid the excessive weight (close to 30% for small member associations) of the international clearing fees charged by banks relative to the amounts transferred to IEA.

### 7.2.2. Assets, Liabilities, and Equity

Tables 7.1-7.3 present the Assets, Liabilities, and Equity between 2018 and 2020. Cash assets as of 31 December 2020 were USD 352,712, and there was also USD 15,000 in Seed Funds receivable (see summary in Table 7.1). Of the total cash assets, 42 percent were in the cash account, 4 percent in seed money, and 54 percent in the investment account.

Figure 7.1 “The trend of Assets for six three-year periods between 2003-2005 and 2018-20” shows that except, for a small drop in 2015-2017, the assets have been increasing steadily.

**Table 7.1. Assets of 2018–20**

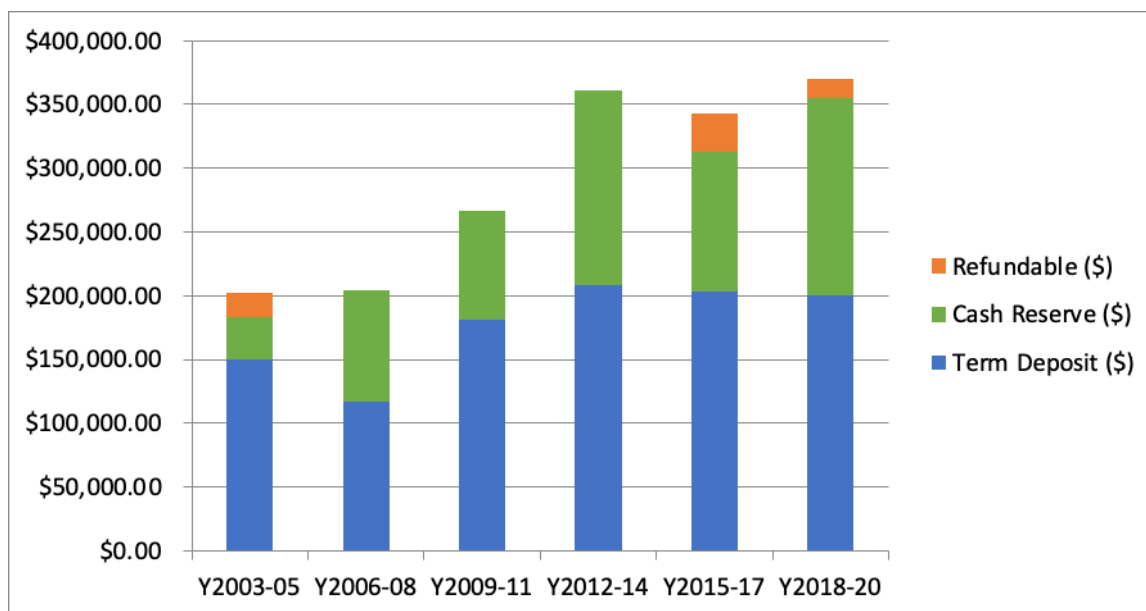
Assets (USD)	Y2018	Y2019	Y2020
Savings Account	89,622	124,066	154,712
Term Deposit – Investment Account	192,623	200,000	200,000
Seed Money Receivable	30,000	15,000	15,000
Advancements	919	1,033	
<b>TOTAL ASSETS</b>	<b>313,164</b>	<b>340,099</b>	<b>369,712</b>

**Table 7.2. Liabilities of 2018–20**

Liabilities (USD)	Y2018	Y2019	Y2020
Dues Advanced Received	378	484	225
Accounts Payable	30,749	12,209	19,607
Earmarked Funds	15,397	15,355	15,355
<b>TOTAL LIABILITIES</b>	<b>46,524</b>	<b>28,048</b>	<b>35,187</b>

**Table 7.3. Equity of 2018–20**

Equity (USD)	Y2018	Y2019	Y2020
<b>TOTAL EQUITY</b>	<b>266,640</b>	<b>312,051</b>	<b>334,526</b>



**Figure 7.1. Trend of Assets for the periods from 2003-05 to 2018-20 (US\$)**

### 7.2.3. Revenue and Expenditures

Tables 6-8 present the Revenues, Expenditures, and Net Operating Results for the 2018-2020 period. The Revenues of 2019 (USD 157,561) appear to be significantly larger than those of its adjacent years: USD 66,940 in 2018 and USD 90,758 in 2020. This is due to the increase in sustaining member contributions (a step change in yearly recurring revenue) and receipt of the capitation fees from the IEA Triennial Congress. Expenditures in 2019 were USD 112,150, significantly higher than those of the previous year, but in line with the intentions underpinning the increased revenue that year.

Figure 7.2 shows the trend of total revenues, total expenditures, total balance and total dues for the three-year periods between 2003-05 and 2018-20. The Total Revenues (blue line) of the period of 2018-20 were 32% higher than the average of previous periods. This is due to the outcome of the last IEA Triennial Congress, which generated USD 28,009 in capitation fees, and to the increase in sustaining member contributions. The Total Expenditures (red line) increased much more slowly than did the total revenues, yielding a positive financial outcome for the period, and the actions undertaken are deemed successful. The Dues (green line) look steady overall.

Figure 7.3a shows the breakdown of the Revenues for the period of 2018-20. Figure 7.3b shows the breakdown of the Revenues for the previous period (2015-17) for comparison. 79% of the total revenues were obtained from membership dues and sustaining members' contributions. At 9%, the contribution of Capitation Fees towards revenues is still below its historic position, and it is expected that the Revenues structure will revert towards its previous configuration, with about 25% of revenues derived from capitation fees and Congress-related IDC Funds. Previous Triennial Reports have made similar observations about the capitation fee share (at 28%) in the revenue structure. The ILO funds provided to IEA to develop new ILO guidelines were booked under Miscellaneous, accounting for this rubric's jump to 12%.

Table 7.4 shows the breakdowns of the Expenditures for the period of 2018-20. The fractions of the Office, Meeting, and Web Site are 20%, 13%, and 16%, respectively. The fractions of the same titles for 2015-17 were 10%, 2%, and 9%, respectively. A total of the Representation & Outreach (previously Travel Executives) and the Standing Committees is 30%, whereas the sum of the same

categories for 2015-17 was 74%. This reduction is in large part due to the constraints imposed by the Covid-19 pandemic.

Figure 7.4a shows the breakdown of the Expenditures for the period of 2018-20, and Figure 7.4b shows the breakdown of the Expenditures for the period of 2015-17, highlighting the reductions in the Representation & Outreach and the Standing Committees rubrics

**Table 7.4. Revenues for 2018-2020**

Revenues				Sum	Average
Sources	Y2018	Y2019	Y2020	2018-2020	2018-2020
Membership dues	39,830	44,412	42,070	126,312	42,104
Sustaining member contrib	26,000	54,136	42,642	122,778	40,926
Capitation fees	484	28,009	0	28,493	9497.667
Funds Contribution	0	0	0	0	0
Interest		3,509	259	3768	1884
Exchange Rate Gains		23	31	54	27
Miscellaneous	627	27,472	5,756	33855	11285
<b>Total Revenues</b>	<b>66,940</b>	<b>157,561</b>	<b>90,758</b>	<b>315,259</b>	<b>105,086</b>

**Table 7.5. Expenditures for 2018–20**

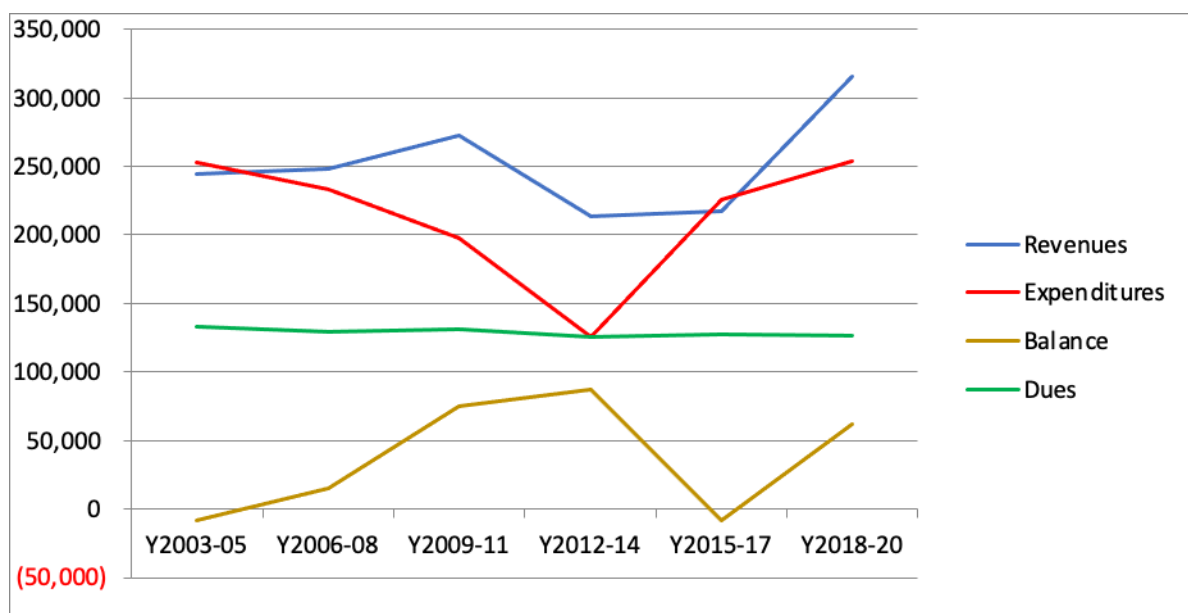
Expenditures				Sum	Average
Uses	Y2018	Y2019	Y2020	2018-2020	2018-2020
Meeting	7,459	23,993	862	32,314	10,771
Representation & Outreach	24,767	13,066	0	37,833	12,611
Office (includes CONSAVO legal)	17,620	19,381	12,493	49,494	16,498
Awards Committee	0	12,600	28,500	41,100	13,700
ID Committee	5,005	3,577	0	8,582	2,861
PSE Committee	4,816	2,894	0	7,710	2,570
STP Committee	973	661	0	1634	544.6667

Historian	2,634	6,232	0	8,866	2,955
DP Committee	0	1,915	0	1915	638.3333
CPR Committee	0	10,456	0	10,456	3,485
Grants	0	0	0	0	0
Bank charges	1,585	1,826	462	3,873	1,291
Website	9,032	9,000	21,968	40,000	13,333
Exchange var & clearing fees	0	785	0	785	262
Miscellaneous	95	5,764	2,946	8,805	2,935
<b>Total Expenditures</b>	<b>73,987</b>	<b>112,150</b>	<b>67,230</b>	<b>253,367</b>	<b>84,456</b>

IEA suffered an unexpected credit-card fraud expenditure in December 2020. A credit card sent by registered mail from Switzerland to the USA was stolen in transit and used in the USA, where a PIN is not required to authenticate use. The full details of the case are still under investigation by U.S. authorities. Due to the specifics of the case, IEA will have to bear the losses, part of which, of USD 2,931.00, was billed in December and booked against 2020 Miscellaneous Expenses. In response to this case, UBS has since agreed to send its credit cards directly to the U.S., an option previously unavailable.

**Table 7.6. Net Operational Results for 2018–20**

Net Operational Results				Sum	Average
	Y2018	Y2019	Y2020	2018-2020	2018-2020
<b>Surplus or Loss</b>	<b>-7,047</b>	<b>45,411</b>	<b>23,528</b>	<b>61,892</b>	<b>20,631</b>



**Figure 7.2. Trends of the total Revenues, total Expenditures, total Balance, and total Dues for the periods from 2003-05 to 2018-20 (US\$)**

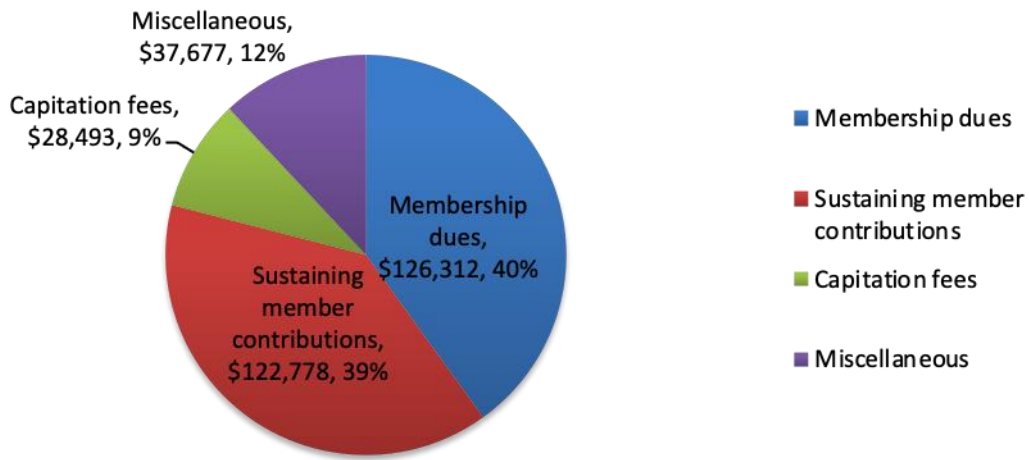


Figure 7.3a. Breakdown of the total Revenues for the period of 2018-20

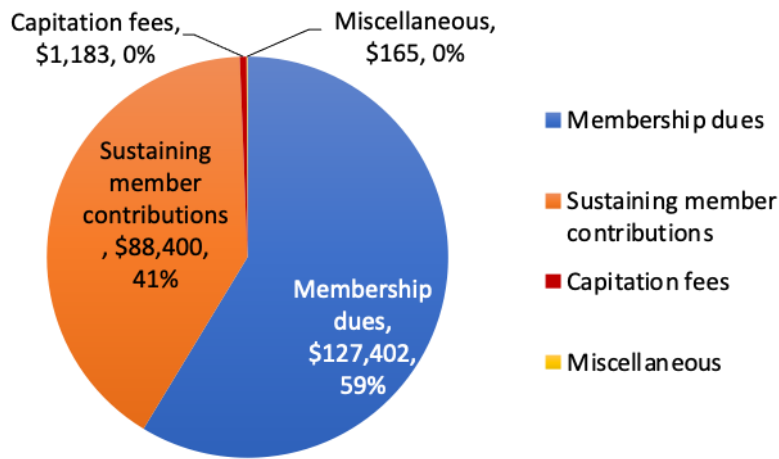
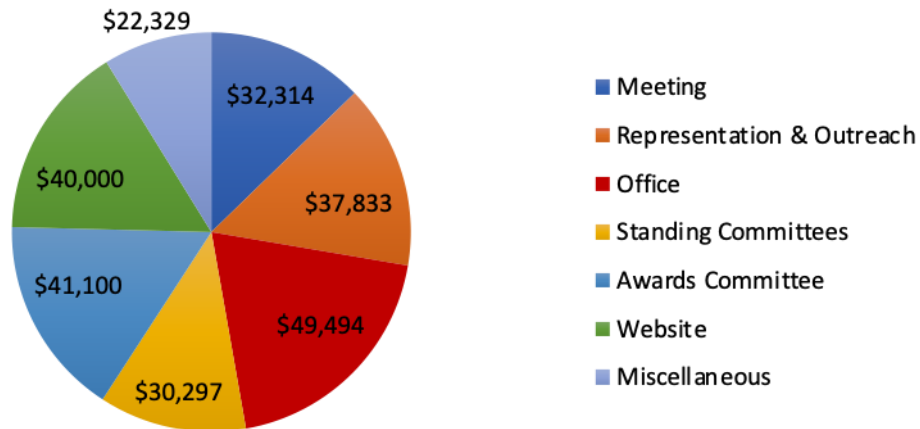
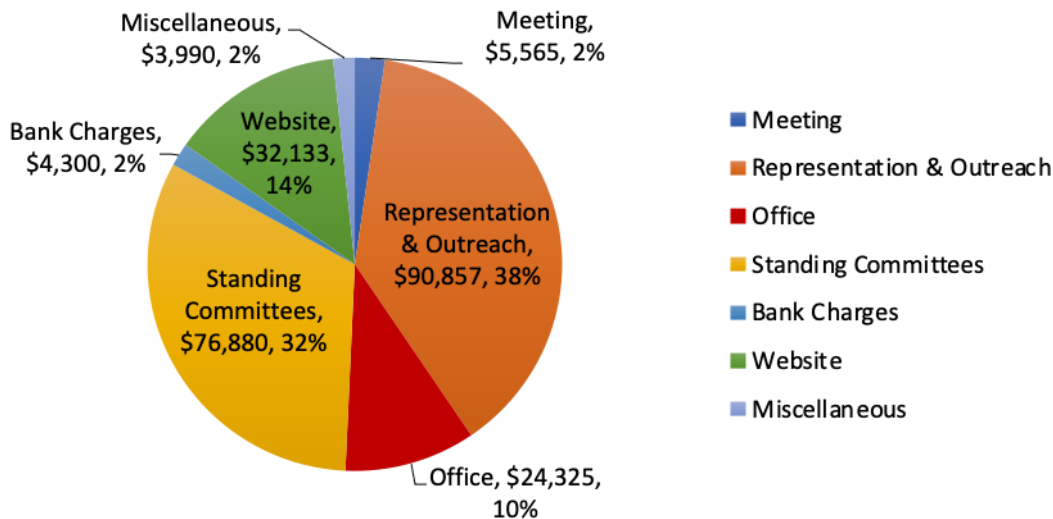


Figure 7.3b. Breakdown of the total Revenues for the period of 2015-17



**Figure 7.4a. Breakdown of the total Expenditures for the period of 2018-20**



**Figure 7.4b. Breakdown of the total Expenditures for the period of 2015-17**

#### 7.2.4. Concluding Statements

Although year-to-year fluctuation is significant, IEA's financial performance seems steady in terms of the three-year period governed by Triennial Congresses. This appears to be true generally, despite the poor performance relative to capitation fees during 2015-17.

Even though IEA's financial performance is steady, there are a few issues identified in the period of 2018-20. These include the following:

- A significant investment (one-time expense) was made towards the IEA's website. At the same time, a change in website hosting has reduced this expense significantly.
- IEA has improved its accounting and reporting practices as required by Swiss regulations, implementing the Banana Accounting software application recommended by its accountants.



- There are a number of initiatives undertaken, but it is strongly recommended to work out more good project plans and implement them, along with additional effort to explore external resources more systematically.

### 7.3. Infrastructure

IEA needs a strong infrastructure in order to accomplish our mission and goals as reflected in these policies. We have taken several steps during this term to reinforce and enhance our operational infrastructure, including:

- Development and launching of the redesigned IEA website.
- Virtual meetings with internal and external stakeholders using Zoom and other platforms.
- New Sustaining Members, who contribute to IEA operations.
- Maintenance of the communication infrastructure through Constant Contact and [iea.cc](http://iea.cc)
- A new enhanced accounting system, which enables IEA to navigate the Swiss regulatory structure.
- Initiation of an ad hoc committee to examine the IEA Business Model and make recommendations for changes and enhancements.
- Formalization of the publication agreement with the publisher Springer as an occasion for publishing for free Conference Proceedings for the Triennial Congress and congresses of the Federated Societies

#### 7.3.1. Website

##### 7.3.1.1. Overview

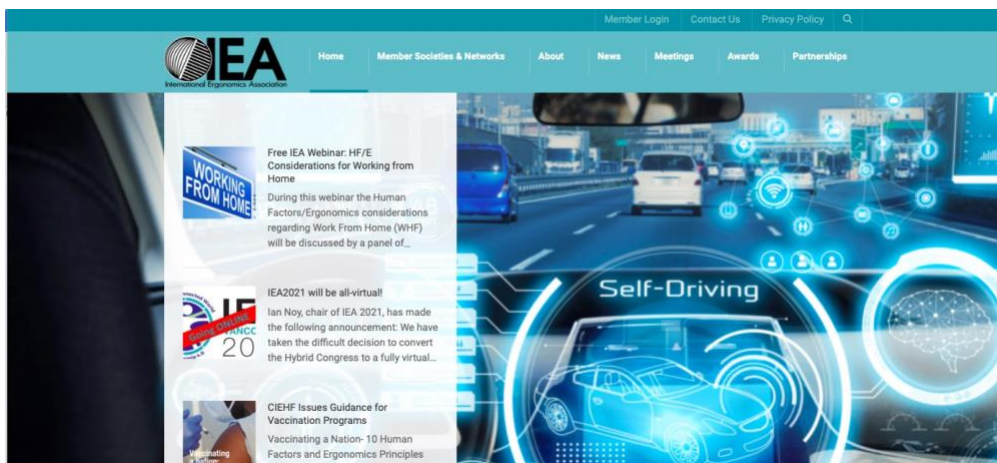
The [iea.cc](http://iea.cc) website is a primary means of communication and outreach for IEA. It provides information transmission and communication among IEA members and with the external community. Tasks involved in maintenance of the website include:

- Maintenance and updating of web pages
- Improvement of management tools
- Enhancement of communication



**Takashi Kawai**

During the 2018-2021 term, the website was recreated through the outstanding efforts of Takashi Kawai, chair (until 2020) of the IEA Infrastructure Committee, Sara Albolino and the entire team supporting this project, and our consultant, Kian Leong Thong of Websolutions, Ltd.



**Figure 7.5 Partial view of redesigned IEA.cc home page**

The Japan Ergonomics Society (JES) generously provided programming assistance and hosting of the IEA website from 2012 to 2020. In 2020, we transitioned from the JES-hosted site to a new server and an updated format.

### **7.3.1.2. Website Short-term Plan (2018-2021)**

Figure 7.5 shows a screenshot of the new [iea.cc](http://iea.cc) home page. During this term, the goal was to maintain the following operations while preparing and implementing the new site:

- keeping the latest information on the website
- managing the server system
- improving the content-management system (CMS)
- utilizing the broadcasting and internal-access functions
- optimizing /preserving archived data
- using the broadcast Email function to send updates and information about deadlines and awards to our members and supporters
- posting messages from the Executive Committee on the home page
- announcing MOUs, awards, research solicitations, and IEA Endorsed Events.

### **7.3.1.3 Website Strategic Design**

The goals for the new website included timely information updates and content management with better usability. Whereas the previous site had limited capability for updating content without the aid of our contractor, the new website was designed to allow easy updating of virtually all content through a Word Press CMS without assistance from outside consultants. This enabled the realization of the goal to increase the cost-effectiveness of system management and improvement of website security. The new site was also designed to enable the critical function of storage and maintenance of the IEA Digital Archives. In so doing, the website was designed to be not only a primary communication tool, but also a mechanism for enabling the functional preservation of IEA's information assets.

### **7.3.1.4 Activities and Outcomes**

Examples of the activities and outcomes from the short-term plan include:

- Launch of the new website with updated design and improved content management and archiving function
- Improved communication of news items through the "Headline News" blog
- Expanded "resources" links, including timely information on COVID-19 resources

### **7.3.1.5 Summary**

Thanks to the efforts of Takashi Kawai, Sara Albolino, and the working group for the IEA Website Recreate Project, the transition to the new website occurred ahead of schedule in 2020. Content is updated on a continuous basis, and modifications and improvements to the structure, content, and navigation features are anticipated in the near future.

Together with the consolidation of the website, we reinforce the use of the social media as on the IEA Facebook page and keep using the Constant Contact messaging system for effective communication with Federated Societies.

### **7.3.2. Registration**

In 2011, IEA became an international not-for-profit organization in Zürich, Switzerland, pursuant to article 60 et seq of the Swiss Civil Code under the official name “The International Ergonomics Association.” The IEA was registered as a “Not for Profit Association” at the commercial register in the Canton of Zürich, Switzerland, under the number CH-020.6.001.285-4.

In 2017, IEA moved its registration from Zurich to Geneva. Now, IEA is registered as an international not-for-profit organization in the municipality of Thônex, Canton of Geneva, pursuant to article 60 et seq of the Swiss Civil Code.

The new registration in Geneva has brought us a lot of practical benefits. Now, all formal administrative operations can be made in English. It has also enabled us to strengthen the financial infrastructure, such as possession of corporate bank account at Union Bank of Swiss (UBS), corporate credit card, debit card, and PayPal account. The PayPal account is expected to facilitate international small-amount remittances. These are believed to have significantly strengthened the administrative infrastructure of IEA.

These accomplishments were facilitated by CONSAVO Legal Ltd. (formerly Araki Legal), Tödistrasse 27, CH - 8002 Zürich, Switzerland. Our responsible contact is Mr. Olivier J. Araki, Managing Partner. IEA also counts on CONSAVO legal experts’ support in annual tax-filing actions in compliance with Swiss regulations.

### **7.3.3. Accounting System and Related Matters**

The transition of the IEA’s accounts, which were kept in Excel, to Banana Accounting Software, the tool recommended by our Swiss accountants, is complete. This makes the interaction between the IEA’s treasury function and the IEA’s accountants very easy. This software is able to handle accounts in several currencies, a facility used to book transactions in U.S. Dollars and Swiss Francs and to generate reports in CHF for the Swiss tax authorities and in USD for our internal reporting and communications.

With one exception, the changes to the IEA’s accounting system highlighted in the previous Triennial Report (headings, expense allocation, etc.), replicated below, were fully implemented in the Excel bookkeeping and are current practice in the Banana Accounting Software. No further changes have been deemed necessary since then.

From the 2015-2018 Triennial Report: "There were a small number of changes to accounting headings, and also some changes to expense allocation".

Allocation of travel expenditures, previously all grouped in the “Travel Executives” heading, to their respective Committee Accounts, and,

In a related move, renaming the “Travel Executives” account as “Representation & Outreach.”

The handling of the funds administered by the IEA was also the focus of several adjustments:

- the definition of what moneys are or are not “Funds,”
- how they are booked, and
- what expenses are charged to them.

The break-out of website expenditures into website maintenance and operation and website development has been maintained due to its management usefulness even though the original reason for doing this (treating the website as an asset) is not possible due to the local tax regulations.

#### **7.3.4. Permanent Secretariat**

In 2016, the IEA Council approved the establishment of a permanent IEA Secretariat office to support the Council members and the IEA Executive Committee. The establishment of this office provides a significant improvement to the IEA infrastructure. IEA engaged Lynn Strother Consulting to provide the Administrator role for the IEA Secretariat on a contractual basis. Lynn has had extensive experience in the management and administration of HF/ES, an organization with approximately 4500 members in the U.S.A. and other countries. She is also very familiar with IEA and its structure and has attended IEA Council meetings as an ex-officio member of the HF/ES delegation. Lynn worked on the IEA 2000 Congress hosted by HF/ES in San Diego and created/monitored the budget and oversaw meeting logistics. Because of her expertise, Lynn is able to provide services at a very high level and is an excellent asset to IEA. During the first year of her engagement, VPSG Kathleen Mosier and Lynn developed the specific parameters of the position, and it has evolved continuously since then. Lynn has taken on many of the administrative tasks for IEA and provides continuity and institutional memory as members of the Executive Committee change. She is and will continue to be an excellent asset to IEA.

#### **7.3.5. The IEA Press and Publication Policy**

The IEA Press serves as the virtual publishing house of IEA. During this term the IEA Press issued ISBNs for the following IEA publications, all of which are available for download at <http://iea/cc:>

978-0-9976041-3-9

IEA Triennial Report 2015-2018

All rights reserved. Copyright 2018 by IEA

978-0-9976041-4-6

History of the International Ergonomics Association: 1985-2018

Editor: Ernst Koningsveld

Illustrator: Lynn Strother

All rights reserved. Copyright 2019 by IEA.

978-0-9768143-5-1

*7 Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices* (Original English Version)

Japan Ergonomics Society; T. Ebara and R. Yoshitake (Eds.)

Published 2020

All rights reserved. Copyright 2020 by IEA

978-0-9768143-3-7

*7 Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Japanese Translation*

Japanese Human Factors and Ergonomics Society.

Published 2020.

All rights reserved. Copyright 2020 by IEA

978-0-9768143-7-5

*Seven Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Chinese Translation Using Traditional Chinese Characters*

Author: Japanese Human Factors and Ergonomics Society

Translator: Chien-Chi Chang, Ph.D., Ergonomics Society of Taiwan  
Published: 6 May 2020  
All rights reserved. Copyright 2020 by IEA

978-0-9768143-1-3

*Seven Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Chinese Translation Using Simplified Chinese Characters*

Author: Japanese Human Factors and Ergonomics Society

Translator: Wei Zhang

Published: 6 May 2020

All rights reserved. Copyright 2020 by IEA

978-0-9768143-8-2

Tujuh Panduan Praktikal Faktor Manusia dan Ergonomik (HF/E): Bekerja/Pembelajaran Dari Rumah menggunakan Peranti Tablet/Telefon Pintar

*Seven Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Bahasa Malaysian Version*

Japan Ergonomics Society (original version); Human Factors and Ergonomics Society Malaysia (Translation)

All rights reserved. Copyright 2020 by IEA.

978-0-9768143-9-9

7 เคล็ดลับ \_เพื่อการปฏิบัติตนเองทางการยศาสตร์และมนุษยปัจจัย \_

ในการทำงานและการเรียนรู้ผ่านทางไกลโดยใช้อุปกรณ์แท็บเล็ตหรือสมาร์ทโฟน \_

*(Seven Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Thai Version)*

Author: Japan Ergonomics Society

Translator: Ergonomics Society of Thailand.

All rights reserved. Copyright 2020 by IEA

978-0-9766435-2-1

Sete recomendações de Ergonomia para o teletrabalho em case e/ou Ensino/aprendizagem à distância para utilizadores de Computadores Portáteis, Tablets e outros dispositivos móveis – Versão em Português (Brasil)

*(Seven Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Brazilian Portuguese Version)*

Author: Japan Ergonomics Society

Translator: Associação Brasileira de Ergonomia (ABERGO)

Published June 25, 2020

All rights reserved. Copyright 2020 by IEA.

978-0-9796435-1-4

Sete recomendações de Ergonomia para o teletrabalho em case e/ou Ensino/aprendizagem à distância para utilizadores de Computadores Portáteis, Tablets e outros dispositivos móveis – Versão em Português (Portugal)

*Seven Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices: Portugal Portuguese Version)*

Author: Japan Ergonomics Society

Translator: Pedro Ferreira, Associação Portuguesa de Ergonomia (APERGO)

Published: June 25, 2020

All rights reserved. Copyright 2020 by IEA

978-0-97596435-0-7

Doce consejos de Ergonomía/Factores Humanos (E/FH) para realizar actividades remotas (teletrabajo) o tareas de aprendizaje en casa usando tabletas y teléfonos inteligentes.

(Twelve Practical Human Factors and Ergonomics (HF/e) Tips for Teleworking/Home-Learning Using Tablet/Smartphone Devices—Spanish Version)

Author: Japanese Ergonomics Society

Translator and editor: Carlos Espejo, President, La Union Latinoamericana de Ergonomía (ULAERGO)

Published October 2020.

IEA Press. Copyright 2020. All rights reserved.

The collaboration with Springer for having an IEA publication agreement has been established, and we now have a signed formal agreement for five years, to be renewed, and all Federated Societies can now publish under the IEA umbrella the scientific production of their conferences with no additional costs. We can also publish scientific work with some good economic conditions.

In order to involve the Federated Societies, we also distributed an important survey to determine what societies want and need from IEA and how we can better serve our members in the future.

### **7.3.6. Develop more-effective communication and collaboration with Federated Societies**

One of IEA's primary goals is to develop more-effective communication and collaboration with Federated Societies, our internal stakeholders. With EC members, we conducted several activities to address this goal.

Based on the feedback of the Federated Societies, we consolidate our new IEA website and we used it for new services: the publication of the *IEA NewsBriefs*, distributed monthly and providing updates on IEA and member society activities; the dissemination of the Federated Societies' activities for coping with the COVID-19 pandemic, with the translations of the Japan Ergonomics Society document *Seven Practical Human Factors and Ergonomics (HF/E) Tips for Teleworking/Home-learning using Tablet/Smartphone Devices*; the launch of two calls, in collaboration with international and national institutions, for collecting professionals' stories related to COVID-19.

## 7.4. Awards Standing Committee

### Yushi Fujita, Chair

It is an important function of the International Ergonomics Association to award formal recognition to members of Federated Societies who have made outstanding contributions to the field of HF/E on an international level.



Two new annual awards are introduced:

- **The IEA/Kingfar Award for Student Research in Human Factors and Ergonomics Issues in Industrially Developing Countries** (The IEA/Kingfar Award) sponsored by Beijing Kingfar International Inc. (China). The IEA/Kingfar Award is given annually to honor persons who have made high-quality human factors/ergonomics (HF/E) research achievements that address issues typical of industrially developing countries (IDCs). The purpose of the award is to encourage a deserving person to further explore original research and applications on HF/E issues typical of IDC, thereby potentially improving the well-being of people in IDCs; and
- **The IEA/Tsinghua Award for Collaborative Human Factors and Ergonomics Education for Industrially Developing Countries** (The IEA/Tsinghua Award) sponsored by the Department of Industrial Engineering, Tsinghua University (China). The IEA/Tsinghua Award for Collaborative Human Factors/Ergonomics Education for Industrially Developing Countries is given annually to honor persons (e.g., researchers, teachers) who have made significant and outstanding contributions to the success of postgraduate educational programs that have human factors/ergonomics (HF/E) courses in the curriculum or contain substantial HF/E content in some courses, through international and/or inter-regional collaboration.

Because of the COVID-19, some awards will have to be given after IEA2021. The award recipients for the period of 2019-2021 are shown in the following sections.

### 7.4.1. Triennial Awards, nomination due by 11 January 2021

#### (1) IEA Distinguished Service Award

- No nomination was received

#### (2) IEA Triennial Outstanding Educators Award

- Jim R. Potvin (ACE)

#### (3) IEA Award for Promotion of Ergonomics in Developing Countries

- Yassierli (Indonesian Ergonomics Society [PEI])

#### (4) IEA Ergonomics Development Award

- Erik Hollnagel



**(5) IEA Human Factors and Ergonomics Prize**

- The CIEHF Defence Sector Group

**(6) IEA/Elsevier John Wilson Award**

- Patrick Waterson (CIEHF)

**(7) The IEA President's Award**

- Y. Ian Noy

**(8) K U Smith Student Award**

- Sadeem M. Qureshi (ACE)
- Stephan Huber (Institut Mensch-Computer-Medien, Julius-Maximilians-Universität)
- Renee L. Greene (University of Wisconsin-Madison)

**7.4.2. Annual Awards**

**(1) IEA Fellowship Award**

**2019:**

- Biman Das (ACE)
- Mica R. Endsley (HF/ES)
- Daryle Gardner Bonneau (HF/ES)
- Göran M. Hägg (NES)
- Yoshinori Horie (JES)

**2020:**

- Anthony D. Andre (HF/ES)
- Mario Cesar Rodriguez Vidal (ABERGO)
- David D. Woods (HF/ES)

**2021:**

- Susan Hallbeck (HF/ES)
- Robert Radwin (HF/ES)

**(2) The IEA/Kingfar Award for Student Research in Human Factors and Ergonomics Issues in Industrially Developing Countries**

**2019:**

- Gilbert J. Huber
- Liuxing Tsao
- Mengli Yu
- Rodrigo Arcuri Marques Pereira

**2020:**

- Qing-Xing Qu
- Carlos Viviani Gonzalez
- Guillermina Andrea Peñaloza

- Natália Ransolin
- Viviana Maura dos Santos
- Vibha Bhatia
- Elaine Aives de Carvalho
- Abdulazeez Uba Muhammad

**2021:** To be selected

**(3) The IEA/Tsinghua Award for Collaborative Human Factors and Ergonomics Education for Industrially Developing Countries (The IEA/Tsinghua Award)**

**2019:**

- D.Y. Sha (EST)

**2020:**

- José Orlando Gomes (ABERGO)
- Vincent G. Duffy (HFES)

**2021:**

- Susan Hallbeck (HFES)
- Robert G. Radwin (HFES)

## 7.5. Communications and Public Relations Standing Committee

Michelle M. Robertson, Chair



Co-Chair, Dr. Gretchen Macht, Global Ergonomics Month

Editor IEA NewsBriefs: Dr. Erin Chiou

Ad hoc committee member: Dr. Jin Lee

### 7.5.1 Introduction

Promoting awareness and visibility of the human factors/ergonomics (HF/E) discipline in designing devices and work systems is essential. This committee creates and develops various pathways to address the challenges of determining the best avenues to engage with related international organizations and societies inside and outside the HF/E scientific community. Defining strategies to effectively communicate and diffuse human factors/ergonomics knowledge to various stakeholders at the global and local level is also a responsibility of this committee. Communicating and sharing IEA Federated Societies' and Networks' activities and events through the monthly e-newsletter, *IEA NewsBriefs*, provides the opportunity to learn and network with other IEA colleagues on HF/E-related topics and initiatives.

### 7.5.2. Long-Term Plan

The long-range plan of the CPR Committee is to enhance the visibility of IEA and human factors/ergonomics globally by interacting and engaging with Federated Societies, external national and international organizations, and professional/scientific associations worldwide through effective communication and collaboration mechanisms. Coordinating the dissemination of IEA-related information, educational HF/E-related publications, and providing webinars are ongoing CPR efforts. Accomplishing this plan will allow IEA to better leverage and utilize international organizational-relationship opportunities to expand our public relations and outreach efforts, promoting the value of the HF/E field.

### 7.5.3. Short-Term Plan (2018-2021)

The CPR Committee identified three general goals for the three-year plan:

- Promote awareness of IEA activities and initiatives through external outreach communication efforts to support, enhance, and extend IEA collaborations with other international and national organizations and related societies.
- Enhance internal communication among IEA Federated Societies, Networks, and Affiliated Societies to better understand IEA activities and how they can support IEA members' initiatives and programs.
- Engage with IEA Standing Committee chairs and committee members to actively encourage dissemination of the IEA committee's work to raise awareness of IEA and HF/E among various stakeholders, including the public, industry, government, and other societies.

Several tasks and activities were planned and coordinated with other IEA ad hoc committees and Standing Committee chairs to address these goals. Over the three years, various opportunities arose, allowing for specific engagements to occur and fostering and enriching existing external organizational relationships.

#### **7.5.4. Strategic Design**

A system approach serves the CPR strategic design of developing engagements and relationships linking internal IEA operations and activities and promoting external collaborations and joint activities. These communication and outreach efforts have been supported through various activities and subcommittees formed to address the committee's major goals.

#### **7.5.5. Activities and Outcomes**

CPR identified several activities during this three-year period that revolved around the goals of the committee. Outcomes of each activity are described, leading to future recommendations for sustaining the activity and promoting its value to IEA members.

##### ***External Organizations and Liaisons***

As described in Section 5 of this report, promoting awareness of IEA and the science of human factors/ergonomics globally by interacting with prominent international and national organizations occurred by engaging with existing external organizations. IEA has several well-established formal relationships with leading international non-governmental organizations (NGOs) and the International Organization for Standardization (ISO). Given that IEA is formally registered by the United Nations (UN), World Health Organization (WHO), and the International Labour Organization (ILO) as an NGO, a close liaison exists among these world bodies. WHO formally recognizes a Non-State Actor representative from the IEA and invites them to attend both the WHO Executive Board (EB) meeting and the World Health Assembly (WHA).

IEA and WHO. An official collaboration plan, endorsed by the WHO Director General and EB, was developed regarding HF/E considerations in patient safety. The 2019-2021 planned activities include: (1) Co-creation of a practical guidance document on the application of human factors and ergonomics (HF/E) principles to patient safety, (2) identification and development of case studies to demonstrate effective interventions and application of human factors and ergonomics principles for improving patient safety, and (3) dissemination of the practical guidance document "Applying HF/E to Healthcare for Patient Safety" and related HF/E patient-safety case studies. Drs. Sara Albolino, Kathleen Mosier, and Michelle Robertson are leading this effort with a team of international HF/E patient-safety experts in collaboration with WHO representatives. These documents will be jointly published on the WHO and IEA websites.

At the 72<sup>nd</sup> WHA 2019 meeting, collaboration with two IEA formal liaison organizations, the International Commission on Occupational Health (ICOH) and the International Occupational Hygiene Association (IOHA), occurred, resulting in delivering a prepared joint statement supporting the need for Universal Occupational Health Coverage including providing specialized or basic occupational health and HF/E services on the Assembly floor. For the 73<sup>rd</sup> WHA meeting, a joint statement was posted, stating that the COVID-19 pandemic once again demonstrated the need for and value of occupational health and human factors/ergonomics services and the high sense of urgency to protect health workers against COVID-19 to safely serve the victims of COVID-19 as guided by WHO. During the WHO Executive Board (EB) 148 meeting in 2021, IEA virtually delivered (presented by M. Robertson) a statement on the EB floor regarding the critical importance of patient safety and recognizing that HF/E has a central role in the design of safe patient-safety systems and advocating for patient safety. Further, IEA contributed to the WHO Global Patient Safety Action Plan

(led by S. Albolino), presented at the “World Patient Safety Day” and provided case studies illuminating the application of HF/E in the design of safe patient-safety systems and advocating for patient safety.

The Global Occupational and Workplace Health Programme office of WHO invited IEA to write a concept note for the technical brief: “Healthy and Safe Telework.” ILO and several other organizations and experts are invited, and an external review process will occur with the final document to be published on the WHO with acknowledgment of IEA authors M. Robertson and K. Mosier.

IEA and ILO activities. A joint collaborative effort between the IEA and ILO was formed to write and prepare a high-level document, entitled “Principles and guidelines for human factors/ergonomics (HF/E) design and management of work systems.” This draft document was prepared over 20 months (August 2018-April 2020) by a dedicated team of expert writers, reviewers, and representatives from IEA, the International Labour Organization, and other institutions and organizations that recognize the critical need for human factors/ ergonomics principles and guidelines in the design and management of work systems. IEA EC members Drs. Kathleen Mosier and Michelle Robertson led the IEA collaboration and contributed to the document as. Dr. Shengli Niu, Labour Administration, Labour Inspection and Occupational Safety and Health Branch (LABADMIN/OSH) of the ILO initiated, guided, and supported the development of this work in accordance with ILO’s vision and priorities for the future of work from occupational health and safety as well as HF/E perspectives. Formal reviews with external experts were conducted twice to provide feedback and suggested revisions. The draft document is posted on the IEA website and will soon be formally released and posted on the ILO website. The completed Principles and Guidelines document is intended to serve as a technical basis for the ILO to develop an international labor standard on workplace good practice on human factors/ergonomics.

In response to the COVID-19 pandemic, ILO invited IEA to participate in the World Day for Safety and Health at Work event by joining the “Stop the pandemic: Safety and health at work can save lives” webinar along with producing two think pieces: 1) “Work from home: Human factors/ergonomics considerations for teleworking,” (M. Robertson & K. Mosier) and “Work at the sharp end: Human factors/ergonomics for protecting healthcare workers and patients” (S. Albolino & K. Mosier). Webinars can be found at the following link at ilo.org: [wcms\\_744624.pdf \(ilo.org\)](https://www.ilo.org/wcms/744624.pdf).

#### New MOUs and collaborations.

IEA is engaged with several related scientific professional societies and established some new formal recognition of these partnerships by exchanging memoranda of understanding (MOUs). The MOUs outline the goals of these relationships, which are to encourage and support participation in each other’s conferences, to collaborate on joint projects and initiatives, and to stimulate communication among the organizations through respective websites, webinars, and workshops. Three MOUs were signed this term between IEA and the following external, related organizations: 1) Foundation for Professional Ergonomics (FPE); 2) Institute of Industrial and Systems Engineers (Applied Ergonomics Branch) and 3) The International Council on Systems Engineering (INCOSE). The FPE, established in 2004 as a nonprofit organization, is dedicated to advancing professionalism in ergonomics. It conducts and supports educational and scientific activities, demonstrating how professional ergonomists serve to make our lives at work and at home healthier, safer, more productive, and more satisfying. IEA and FPE joint activities will involve the promotion of HF/E in research and practice; exchange of HF/E educational resources and tools, and communication of each organization’s activities and events. IISE International, is a nonprofit association, founded in 1948, that provides leadership for the application, education, training, research, and development of industrial engineering. This collaboration will focus on the promotion and development of systems-

design methodologies and approaches to better integrate the domains of human factors/ergonomics and industrial engineering, with a specific focus on enhancing the recognition and understanding of the human as part of the system design. INCOSE was founded to develop and disseminate the transdisciplinary principles and practices that enable the realization of successful systems. Collaboration opportunities and efforts include promoting conferences, joint publications and webinars, and co-marketing materials related to systems engineering and HF/E. Other related organizations with which IEA is engaging and developing new relationships and collaborations are the Asian Council on Ergonomics and Design and the Advanced Imaging Society. Initial discussions are occurring with the World Design Organization about the exchange of conference support.

### ***Enhance communication among IEA Federated Societies and external organizations***

Global Ergonomics Month. October is designated as Global Ergonomics Month (GEM) and is recognized as the Worldwide Month of Ergonomics and Human Factors by the Federated European Ergonomics Societies (FEES). Several IEA Federated Societies and Networks are actively involved in promoting ergonomics and human factors awareness during October. Typically, these planned events and activities are grassroots, community-based activities that target key stakeholders at various levels, such as industries, schools, government agencies, and society at large, and include: 1) providing HF/E information and materials, 2) distributing HF/E case studies, 3) highlighting HF/E methods and discussions of experiences, and 4) providing community and outreach services. One of the Communication and Public Relations Committee's initiatives is to actively support and encourage involvement of IEA Federated Societies and Networks and other relevant global organizations in promoting the science, application, and profession of human factors/ergonomics and to share these event experiences during the month of October. At the IEA 2021 Congress, invited IEA Federated Society and Network Presidents will participate by presenting their respective Global Ergonomics Month (GEM) activities, initiatives, and awareness efforts. The audience will discuss what GEM activities could be further promoted, along with possible joint worldwide activities and initiatives.

### Communication and collaboration survey.

A survey was designed and administered to all IEA Federated Societies, Networks, and Affiliated Societies with the purpose of better understanding how IEA may serve its member societies more effectively, especially during the unique and challenging times of COVID-19. The intent of this assessment was to provide IEA with valuable input to allow IEA to be proactive and to maximize opportunities and minimize any potential negative impact of COVID-19 on our HF/E community. This assessment was primarily focused on one of IEA's three goals: To develop more-effective communication and collaboration with Federated Societies. Our goal was to gain insight on the IEA activities and outputs that are valued by IEA members. We also sought to gain input on potential new activities that fit the members' vision. The top six priorities of activities that emerged were: 1) Triennial Congress 2) Publication & Dissemination, 3) Up-to-date Website, 4) News Briefs, 5) Strategy Future Directions and 6) Educational Requirements. Open-ended comments revealed further details concerning these priorities and are summarized below:

- IEA Congress is critical for supporting HF/E knowledge and dissemination. Important to focus on both academic and practitioners.
- Educational, webinars, virtual meetings for sharing and exchanging experiences (Technical Committees)
- Educational and training curriculum for HF/E
- Conference representation: Virtual, support and promote public relations of HF/E
- Outreach--internationally (ILO, WHO); national; local community; stakeholders
- HF/E Handbook: Consensus on topics and content; global; academic and practitioners
- Early-Career Development: Mentoring for collaborative research projects

Table 7.7 provides an overview of IEA members’ listing of high-priority activities along with several examples of current and future activities.

<b>IEA Priority Activities</b>	<b>Current Activities [Examples]</b>	<b>Future Activities &amp; Initiatives [Examples]</b>
IEA Congress	IEA 2021 Triennial Congress Technical Committee Sessions Practitioners & Case Studies Sessions	IEA 2024 Triennial Congress
Educational Webinars	Two Webinars Delivered COVID related: “Preparedness and Pandemic: The role of human factors and ergonomics in responding to the Covid-19 healthcare emergency” and “Work From Home: HF/E considerations”	Plans for quarterly webinars
Educational & Training Curriculum	-Development of worldwide database for HF/E educational information -IEA endorsed certification systems	-Continued development of the interactive webpage for the map of global HF/E education programs. -Encourage societies to establish a certification system and apply for IEA endorsement.
Outreach activities	Joint collaboration with ILO & WHO producing guidance tools	Dissemination of tools; Coordinate workshops; Translate existing tools
HF/E Handbook	Plan for HF/E handbook led by the IEA ST&P standing committee	Continue development of supplemental materials for applying HF/E in the design of work systems.
Early Career Development	IEA initiated a mentoring network; HF/ESA and HF/ES created early career workshops/sessions at annual meetings	IEA Congress sessions on Early Career Development
Publication & Dissemination	Frame agreement with Springer for Congress and society proceedings and other publications	Continue support to agreement to publish conferences/Congress and other publications
Up-to-date Website	Website was re-created and updated during 2018-2021	Continue to post current activities/events and HF/E guidance tools

*IEA NewsBriefs*. Several activities that IEA is currently implementing regarding internal/external communication is the monthly publication of *IEA NewsBriefs* – “News that you can use.” These *IEA NewsBriefs*, edited by Editor Dr. Erin Chiou, were noted by IEA members to be valuable and to provide useful information about other societies’ activities, events, and educational and practical HF/E guidance tools and resources.

***Dissemination of HF/E knowledge***

Providing and disseminating HF/E scientific materials and other publications promotes the awareness of HF/E and also provides the foundation for influencing design criteria. Recently, IEA endorsed 6 international conferences for scientists and practitioners (see Section 7.9). Dissemination of these conferences’ proceedings is being coordinated with the International Development Standing Committee to support IDC university libraries. Guidelines for the event endorsement process and an application may be obtained through the IEA Secretariat [secretariat@iea.cc](mailto:secretariat@iea.cc)

Other dissemination activities of HF/E knowledge include the organization of webinars and the joint collaborative efforts of developing guidance tools and principles technical white papers. IEA has delivered two webinars related to Covid: “Preparedness and Pandemic: The role of human

factors/ergonomics in responding to the Covid-19 healthcare emergency” and “Work from Home: HF/E considerations.” Quarterly webinars are being planned.

#### **7.5.6. Summary and Recommendations**

Several key activities were undertaken to promote and enhance relationships with external organizations related to IEA, such as producing the joint collaborative document on *Principles and Guidelines for Human Factors/Ergonomics (HF/E) Design and Management of Work Systems*. The Global Ergonomics Month initiative continues to foster engagement among IEA Federated Societies and Networks to promote awareness of HF/E with various stakeholders at the local, governmental, and international levels. Disseminating HF/E educational materials through webinars and regional conferences is important, as is translating existing practical tools and guidelines. New external relations were formalized, and these need to be nurtured to achieve the goal of promoting awareness of the value of HF/E. Collectively, these CPR activities were initiated to illuminate IEA’s mission and values and to demonstrate the impact that the field of HF/E can have on the well-being of workers and on system design. Several of these initiatives are new, and support of these continuing efforts and activities is greatly encouraged.



## **7.6. Development and Promotion Standing Committee**

**Chair: Elina Parviainen**



### **7.6.1 Brief Introduction**

The Development and Promotion (DP) Standing Committee explores and coordinates new policy options and proposals and assists in development and implementation of new programs and initiatives relevant to the function and effectiveness of IEA.

The DP committee develops and coordinates plans and proposals concerning IEA policies, operation, and structure, and assists in development of policy recommendations to better serve the Federated Societies and the international human factors/ergonomics community.

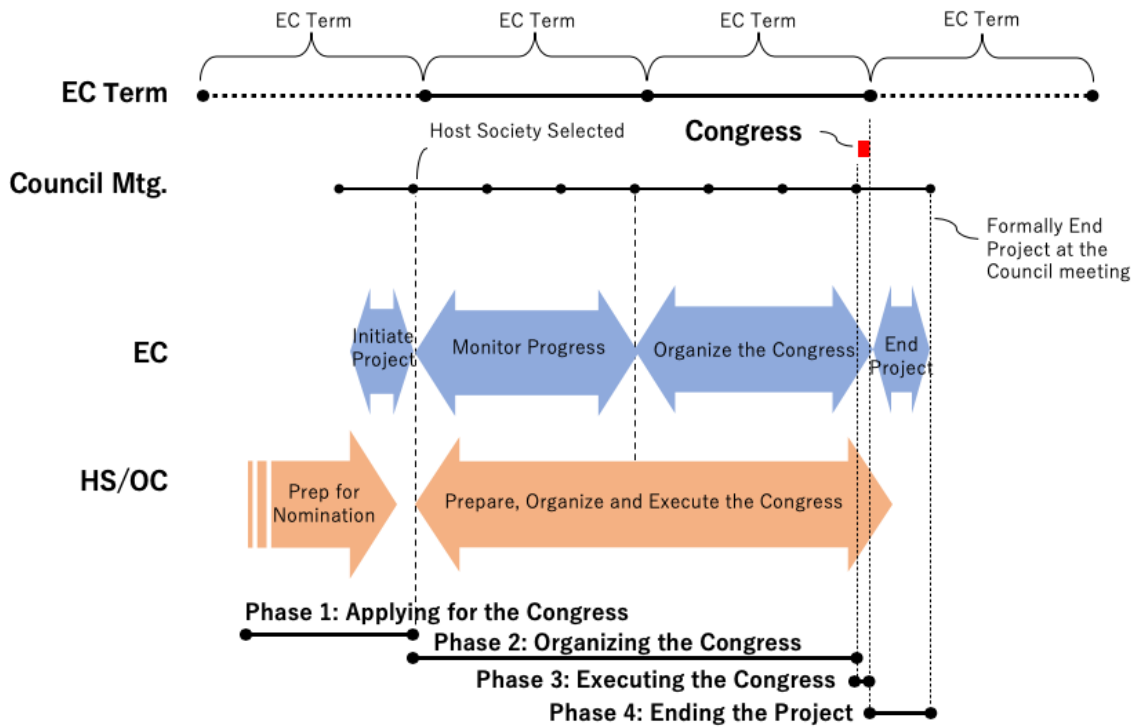
### **7.6.2 Short-term Plan (2018-2021)**

#### ***7.6.2.1 The IEA Congress Model***

The IEA Triennial Congress has been held 20 times since 1961. The purpose of the IEA Triennial Congress Model is to help IEA Executive Committees and host societies manage the complexity of a Congress – from submitting a bid, to preparing for and organizing the Congress, to executing the Congress successfully and creating the final report. Also, the cooperation between the organizing Host Society and IEA Executive Committee through the whole process is taken into account in the description of the Congress model. NOTE: It is important that both Executive Committee and Host Society realize the effect of the changes in the EC and Host Society during the years between applying to host the Congress and creation of the final report. The Congress Model helps in the handover of information and data during the changes in leadership over those years.

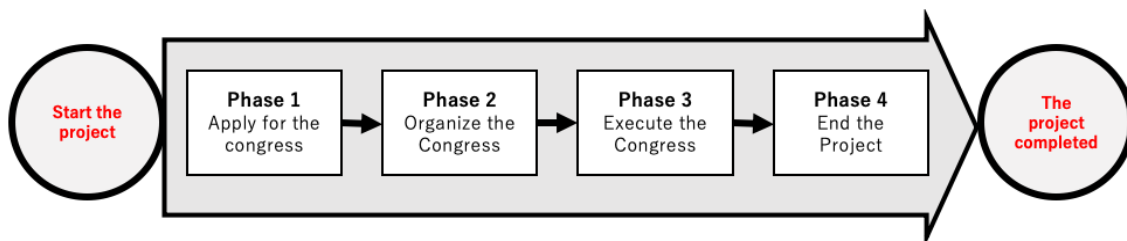
Elina Parviainen, Chair of the Development and Promotions Standing Committee, and Yushi Fujita, IEA Past President and Awards Chair, have created the first version of the Congress Model. In August 2020, an abridged version was shared with IEA Council Members to establish familiarity with the Model.

Because changes in the world require adjustments in our concepts of scientific meetings, and also because technological advances now enable new formats for disseminating scientific information, the Congress Model is a living document. The intent is that it will be reviewed and revised by future Executive Committees and Host Societies as needed to address advances and changes in the world.



**Figure 7.6: Overall Project Process of the IEA Triennial Congress**

The Congress Model describes the main phases and the activities needed for organizing and managing the IEA Triennial Congress.



**Figure 7.7: Top level of the Project Management Process (PMP) of the Congress Model**

The Process Management Process description shows the activities of Host Society/Organizing Committee and Executive Committee. See below.

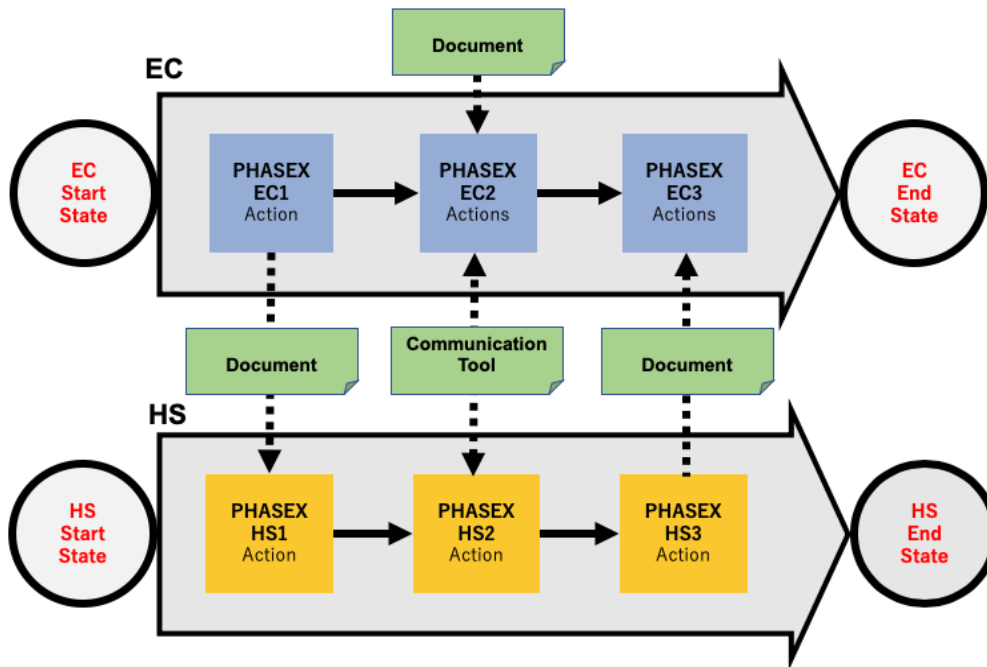


Figure 7.8. A Standard Format of PMP.

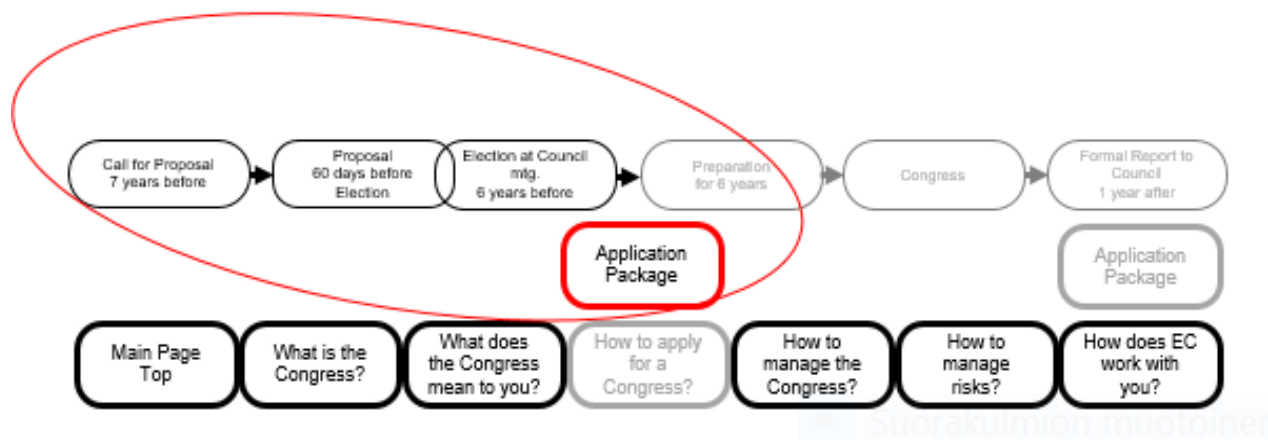
Each step in each Phase is presented with same format and tables of Inputs, actions and outputs.

Start the Project >> PHASE1 EC1 Call for Proposal		>> PHASE1 EC2
Responsible Person: VPSG or an appointed EC person		
<b>Inputs</b>	<b>Activity</b>	<b>Output</b>
<b>Due:</b> 12m before the call for proposal		<b>Due:</b> XXX before the voting
<b>From:</b> IEA Digital Archives		<b>To:</b> PHASE 1 HS1
<ul style="list-style-type: none"> <li>The IEA by-laws</li> <li>OP-Triennial Congress</li> <li>Checklist (Appendix 1)</li> <li>Major milestones (Appendix 2)</li> <li>Previous Call for Proposal Packages (EC archives)</li> <li>Previous MOU (EC archives)</li> </ul>	<ol style="list-style-type: none"> <li>Confirm/understand the input materials</li> <li>Prepare the Call for Proposal Package</li> <li>Announce a call for proposal via IEA Website, News Brief, etc.</li> </ol>	<ul style="list-style-type: none"> <li>Call for Proposal Package               <ol style="list-style-type: none"> <li>Call for Proposal (Appendix 3)</li> <li>Instruction for Drafting Proposal</li> <li>Form for Proposal (Appendix 4)</li> <li>The IEA by-laws</li> <li>OP-Triennial Congress</li> <li>Checklist (Appendix 1)</li> <li>Major milestones (Appendix 2)</li> <li>Templates for MOU (Appendix 5)</li> </ol> </li> <li>Announcement of call for proposal</li> </ul>

Figure 7.9 Example of the Table of Inputs, Actions, and Outputs of Phase 1, Call for Proposals.

### 7.6.2.2 Graphic version of the Congress Model

Because the full Congress Model is more than 60 pages, there is a need for a graphic version for giving an overview of the whole process. This will improve the ease of use of the full version of the Congress Model because in the graphic version, hyperlinks will provide quick access to more-detailed information for each topic. The final placement of the graphic version will be on the IEA website, available for all. The full version of the Congress Model will be placed on IEA website where access can be restricted to IEA members.



**Figure 7.10. Example of the main content of the graphic version and navigation inside the document.**

### ***The Team for Graphic Version***

Because the creation of the graphic version is not only making a document with graphics, careful design of the content of the document and functionality for easy navigating between the graphic version and full Congress Model has to be planned before the realization of the document and software that enables the functionality. In addition to this planning of the graphic version and functionalities, the team will also prepare themselves for piloting the Congress Model. Members of the team are:

- Yushi Fujita, IEA past President and Awards Chair of IEA
- José Orlando Gomes, Vice-Precedent & Treasurer of IEA
- Aleksandr Volosiuk, IREA –Interregional Russian Ergonomics Society
- Elna Parviainen, Chair of the Development and promotion Committee

### **7.6.2.3 Piloting the Congress Model**

The target is to pilot the Congress Model with the IEA2024 and IEA2027. Piloting will be mostly following the activities described in the Congress Model and crosschecking ongoing activities in the Host Societies. Feedback from the Host Societies will be used for fine-tuning the Congress Model. Piloting will also include facilitation of the cooperation between IEA Executive Committee and Host Societies/Organizing Committees throughout the process described in the Congress Model.

At the moment, the Congress Model does not include the organizing activities of a hybrid or fully virtual Congress. This will be created by utilizing feedback from IEA2021.

### **7.6.3 Next activities and important factors for implementing the Congress Model for use by the Host Society and Executive Committee**

#### **7.6.3.1 Creation of graphic version**

Target is to get the graphic version ready during this year (2021).

#### **7.6.3.2 Creation of the functionality between the graphic version and the full Congress Model**

Target is to start the development of the connection and functionality between the graphic version and full version of the Congress Model in May 2021 and get the first version ready during the first quarter of 2022.

### **7.6.3.3 Piloting and fine-tuning the Congress Model**

Planning of the piloting starts at the same time as the creation of the graphic version (May 2021).

The main sub projects to be done are:

- Cooperation with the Host Society of the IEA2021 Triennial Congress will be initiated after IEA2021
- Cooperation with the organizing Host Society of the IEA2024 Triennial Congress will be initiated in July 2021 for starting the piloting.
- Cooperation with the organizing Host Society of the IEA2027 Triennial Congress will be initiated right after the selection of the Host Society of IEA2027.

It is important to notice that the work of the creation of the Congress Model includes at the same time lots of cross-checking of existing procedures, documents, and communication concerning the IEA Triennial Congress. This means that during the work, there is a need to update and describe documents and processes that will help all IEA members to see the benefit of successful IEA Triennial Congresses for promoting IEA and confirming the seven IEA policies. To ensure good results of the work in creating and implementing the Congress Model, there will need to be additional resources for securing the success of the set target--a Congress Model that gives transparency and facilitates cooperation among different parties throughout the whole process of the Congress Model.

## 7.7. International Development Standing Committee

Andrew Todd, Chair



### 7.7.1. Long-Term Plan

The long-term plan of the International Development Standing Committee has been significantly impacted by two overriding factors:

- (1) The implementation of the IEA seven policies as outlined by the IEA president
- (2) Development of a strategic framework for development as outlined and influenced by the strategies put in place by the International Development Standing Committee during the 2015-2018 term of office.

At the heart of these long-term plans was the continued acknowledgment of the lack of knowledge about what human factors/ergonomics (HF/E) is and the lack of high-quality academic programs focused on building HF/E capacity. Therefore, the purpose of the long-term plan was to continue to develop and implement a strategic framework for international development that is flexible and adaptable to diverse contexts; and provides

- Support for growing educational programs and standards in affiliated and federated societies
- Support for growing education programs in potential societies

### 7.7.2. Short-Term Plan

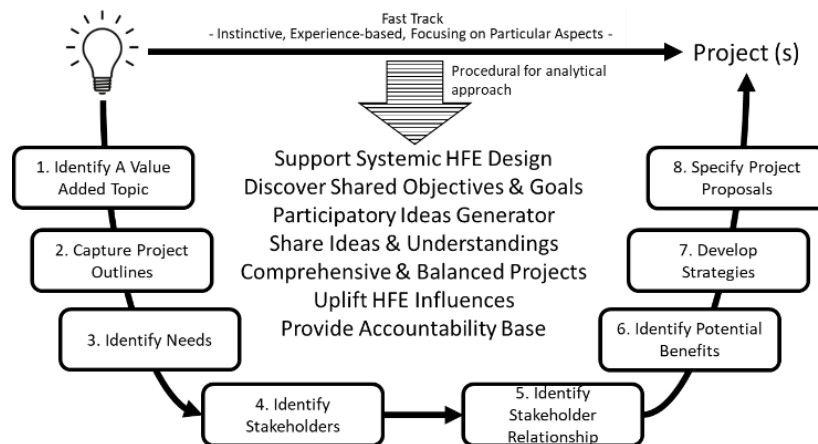
In order to facilitate the long-term plan of supporting the development of strong educational Programs, the following activities were adopted:

1. Implementation of the IEA seven policies through the framework model
2. Support development of academic programs
3. Support stakeholder identification and development

### 7.7.3. Strategic Design

The strategic design for implementation of the International Development Standing Committee long-term plan was based on the General Framework Model (GFM) developed during the 2015-2018 term of office. The philosophy of the model is clearly articulated in the 2018 Florence Triennial report and so is not repeated here. After several trials at implementation of the model, several adjustments and refinements were made at the beginning of the 2018-2021 term of office. The GFM was renamed the Participatory Project Development Toolkit (P<sup>2</sup>DT) to reflect the changes made to the framework.

An emphasis within the toolkit is placed on the identification of value-added topics, the identification and understanding of stakeholders relevant to the topic, and the development of project specifications according to strategies based on these understandings. An outline of the 8 steps of the P<sup>2</sup>DT is provided in Figure 7.11.

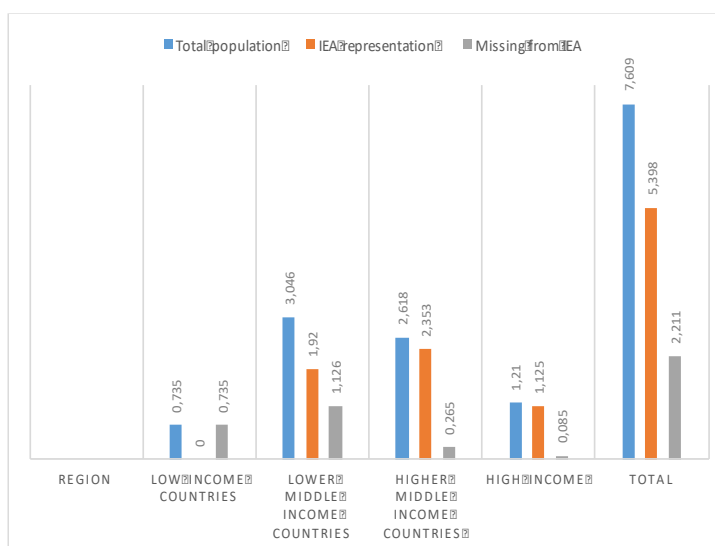


**Figure 7.11. An outline of the steps of the Participatory Project Design Toolkit**

The P<sup>2</sup>DT is designed as a framework to assist with the design of systemic HF/E projects with potential HF/E societies and existing societies. The toolkit is meant to be adapted to suit the local context with various HF/E tools or methods being integrated into the specific steps of the process. As such, not only is the usefulness of the tool illustrated but also how HF/E systems tools can be used effectively to identify value-added topics within systems and then be used to develop the project specifications. At the heart of these activities is an emphasis on participatory design approaches (i.e., the benefits of stakeholder engagement and participation in project development and implementation). As such, the P<sup>2</sup>DT is designed to be applicable to any HF/E-related projects, whether those being implemented by societies or within workplaces. Therefore the P<sup>2</sup>DT has been used to work with Affiliated and Federated Societies, IEA Networks, universities, and potential IEA societies during the 2018-2021 term of office.

**7.7.4. Activities and Outcomes**

**Activity 1: Developing an understanding of the current situation**



**Figure 7.12. An indication of the current reach of the IEA dependent on socioeconomic status**

Previous IEA Triennial Reports have highlighted the regional distribution of HF/E societies across the globe and the need to support development in specific underrepresented areas; however, the current report reflects a further step in developing this understanding by also illustrating the impact of socioeconomic status and IEA representation. The findings of this are reflected in Figure 2, which clearly highlights the fact that low- and low-middle income countries are significantly under-represented in the IEA.

#### **Key Outcomes**

- An indication of the need for the IEA to develop strategies to support HF/E development in low- and low-middle income countries.
- Publication of a textbook chapter “HF/E in underdeveloped countries – How do we foster equitable, egalitarian, and respectful progress” in advancing diversity, inclusion, and social justice through human systems engineering.

### **Activity 2: Development and implementation of P<sup>2</sup>DT**

To implement the long-term plans and seven policies of the IEA the P<sup>2</sup>DT was developed and has been outlined as part of the strategic design for the International Development Standing Committee. The toolkit has therefore been successfully developed and then implemented during the 2018-2021 term of office with several key activities highlighted below:

- IEA-ISQUA (International Society for Quality in Healthcare) workshop on “Applying human factors and ergonomics methods and tools in healthcare in developing countries” at the ISQUA congress hosted in Cape Town, South Africa and presented by Andrew Todd, Sara Albolino, Tommaso Bellandi, and Jono Davy. An outcome being the integration of IEA P<sup>2</sup>DT with World Health Organisation Twinning Partnership for Improvement (TPI) Model through the publication of the paper “From Theory to Real-World Integration: Implementation Science and Beyond” in the Textbook for Patient Safety and Clinical Risk Management. This was a collaborative effort between South Africa, Ethiopia and Italy, again with the important inclusion of academics from countries that are currently not affiliated with the IEA.
- IEA-ULAERGO (Union LatinoAmericana de Ergonomia) workshop on “Sesión Especial de Trabajo “Cómo fomentar el desarrollo de investigaciones y aplicaciones prácticas de ergonomía de alta calidad en América Latina” presented by Andrew Todd and Juan Carlos Hiba in Buenos Aires, Argentina. A special mention must be made of Juan Carlos Hiba for the translation of the P<sup>2</sup>DT workshop material into Spanish and his tireless and meticulous efforts in putting the workshop together. Important outcomes of the workshop have including federated member societies of ULAERGO continuing to implement P<sup>2</sup>DT within their own societies to build strategic goals and activities going forward.
- IEA-ESN (Ergonomics Society of Nigeria) workshop on “Beyond the body: Ergonomics as a systems discipline in developing countries” presented by Andrew Todd and Andrew Thatcher at the ESN annual congress in Enugu, Nigeria. This was the first time that IEA officers had attended a congress of the ESN and facilitated workshops for the society on the development of a systemic approach to the discipline. This resulted in joint funding applications for research activities between South Africa, Nigeria, and Ghana, an important step forward for HF/E collaboration on the African continent and the inclusion of Ghana as a non-IEA affiliated society.
- IEA-Colombia collaboration: Support for the development of a PhD program in Colombia focused on HF/E as a collaboration between the National University of Bogotá and the University del Valle an activity initiated by the IEA in 2013. This program will be the second PhD program in Spanish in Latin America and therefore is serving a vital development role in this region.
- New IEA Awards: Through the BRICSplus network and the CES (Chinese Ergonomics Society) several new IEA Awards have been developed. These new awards (the IEA/Kingfar award and



the IEA/Tsinghua award) are focused on recognition of student research in HF/E in industrially developing countries and on for collaborative education efforts in industrially developing countries. Considering the impact that socio-economic status has on the prevalence of HF/E societies, new awards that focus on building student and education collaboration in these countries is of paramount importance.

- Numerous academic program development in Latin America:
  - IEA-Sociedad Científica Ecuatoriana de Ergonomía (SOCEERGO) collaboration: The support of stakeholder identification and project development through P<sup>2</sup>DT for the assessment of anthropometric characteristics in Ecuador.
  - IEA-SURA Collaboration: Since 2018, IEA has been collaborating with SURA (a large insurance company) to support the development of HF/E in Latin America. Through this collaboration, IEA ran a series of workshops in Colombia in 2018 as part of the first IEA Executive Committee meeting in Cali. IEA is currently working with SURA to have SURA recognized as an IEA sustaining member.
  - IEA-ADEA-National Technological University in Argentina: development of a master's program to support the development of HF/E in South America and to collaborate in training practitioners and academics in Argentina and other Spanish-speaking countries in the region.
  - IEA-SOPERGO Peru: development and implementation of a master's program in HF/E at the University Científica del Sur (private university), Lima, and a continuing education course at the National University of Engineering (public university) in Lima. These programs hope to respond to the demand for practitioners and trainers in several regions of Peru.
  - IEA-SOCHERGO CHILE: collaboration on the development and implementation of a master's program in HF/E at the University of Valparaiso, Valparaiso City, to start in 2021 and a continuing education course on HF/E at the University of Atacama in the north of Chile.
- IEA-ISE-Bangladesh Collaboration: Bangladesh has established a small HF/E society and the IEA, the BRICS Plus Network, and the Indian Society of Ergonomics, through the work of Professor Rauf Iqbal, are supporting the development of the society to allow them to affiliate with IEA shortly.
- Portuguese-speaking ergonomics society network (CPLP Network on HF/E): International Development has assisted in the creation of a new HF/E network that is focused on supporting the development of HF/E in Portuguese-speaking countries. Led by ABERGO (Brazil) and APERGO (Portugal), the network has fostered collaboration with other Portuguese-speaking countries such as Angola, Mozambique, and Guinea-Bissau as founders, and the goal is to include other countries such as: Cape Vert, Sao Tomé e Príncipe, Guinea Equatorial, Timor East, and Macao. This provides an important link for IEA in countries that have had no previous activities. We are grateful for the support of both ABERGO and APERGO in this initiative, and the initiation of the development of a 4-month training course (30h) by Federal Universities of Rio Grande do Sul and Rio de Janeiro plus Instituto Superior Técnico of Lisbon to offer to the countries above listed in 2021.
- IEA BRICS<sub>Plus</sub> Network: collaboration in activities such as webinars, collaborative research on Covid-19, collaborative supervision of graduate students, development of common strategies for publishing, a network website design, as well as supporting activities at each country's national congress on HF/E: ABERGO, IREA, HWWE, CES, and ESSA. Also, IEA BRICS<sub>Plus</sub> Network has been working with CES in order to collaborate on organization of an HF/E society in Pakistan.
- IEA2021 support for low- and middle-income countries: IEA was able to provide financial support for five delegates to attend the virtual IEA Triennial Congress in 2021 from each Federated Society in these countries. The Congress organizers are thanked for the support and low fees for members from these countries.

- Romania: new society was created with support of FEES (<https://www.ergonomics-fees.eu/node/264>)

#### **Key Outcomes**

- First visit of IEA to Nigeria and Nigeria moving from recognition as an affiliated society of the IEA to a federated society
- Publication of the P<sup>2</sup>DT workshop material in both English and Spanish
- Development of PhD and master's programs in Spanish in Latin America
- Implementation of P<sup>2</sup>DT with both external and internal stakeholders of the IEA
- Collaboration with IEA federated societies and potential new societies
- Development of a new network to support HF/E development in Portuguese-speaking countries

### **7.7.5. Conclusions and recommendations**

#### **Conclusions:**

The International Development Standing Committee has again been very busy during the 2018-2021 term of office as evidenced by this report. Although, the COVID-19 pandemic has had an impact on some of our activities and the promotion of workshops to develop strategic activities for the future of HF/E, we have been able to adapt well and make significant progress. At the beginning of 2015, IEA made the strategic decision to focus international development on a sustainable pathway through the development of strong academic programs that produce research and practitioners of high quality. I am proud to say that we have made significant progress in this regard and have been able to foster the development of new programs in several countries around the world. Furthermore, through the development of IEA networks and increased collaboration with networks, we have been able to develop stronger academic collaboration across countries. It is clear that a long-term strategy that transcends terms of office within IEA is a key goal for international development going forward. I would like to thank everyone who has contributed to the International Development Standing Committee over the last three years, as the report reflects that there are many people from across the world with whom we have worked to foster the development of HF/E. There is little doubt that this strong emphasis of a participatory approach with stakeholder inclusion has been a key factor in the successes outlined in this report. I would also like to single out my co-chairs, Professor Paulo Oliveira from Brazil and Professor Hakim Benchechrone from France, for their efforts and dedication to the development of HF/E.

#### **Recommendations:**

There are several recommendations for consideration going forward:

- The continued focus on long-term sustainable development of HF/E through strengthening the provision of high-quality HF/E education and practitioners.
- Further implementation of P<sup>2</sup>DT with IEA Societies and Networks to be responsive to needs identified by key stakeholders.
- Funding of international development is an important consideration going forward. There is a need to establish the IDC fund with a more clearly articulated purpose and with communication to funding societies to promote further funding. Active search for further external funding using the P<sup>2</sup>DT proposed by the IEA committee is also needed.

## 7.8. Professional Standards and Education Standing Committee

**Chair:** Prof. Chien-Chi (Max) Chang

**Certification Subcommittee Chair:** Dr. Maggie Graf



### Co-chairs:

*Europe region:* Dr. Margaret Graf

*North America region:* Dr. Nancy Cooke

*Africa region:* Prof. Hakim Bencheekroun

*Latin America region:* Prof. Mario Vidal

*Asia Region:* Dr. Frederick Tey, Dr. Toriizuka Takashi, Prof. Shamsul Bahri Mohd Tamrin, Prof. Frank Lin

### 7.8.1. Brief Introduction

The Professional Standards and Education (PS&E) Standing Committee provides advice about human factors/ergonomics (HF/E) education and guidance on professional conduct. It also promotes the development of and endorses professional certification schemes.

### 7.8.2. Short-term Plan (2018-2021)

#### 7.8.2.1 Global HF/E Education: Map development

Many public and influential stakeholders would like to understand HF/E educational and training information, however, it is often challenging to find suitable resources for this purpose. For those HF/E educational institutes who need to extend or specialize their educational programs, knowing the program details of other HF/E-related institutions in different areas may provide help.

Therefore, to promote the advancement of the science and practice of ergonomic education at an international level, this project aims to develop a worldwide database for HF/E educational information.

#### 7.8.2.2 Collaboration with Asian Council on Ergonomics & Design (ACED) for HF/E education development

Currently, Asian Council on Ergonomics & Design (ACED) members are at the critical point of acquiring knowledge for promotion of the quality of the HF/E educational system. The aim of this project is to better understand the challenges ACED is facing and work with its members during their development of the HF/E educational framework and core competencies.

### 7.8.3. Strategic Design

#### 7.8.3.1 Global HF/E Education: Map development

The Professional Standards and Education Standing Committee designed a questionnaire for surveying HF/E educational information worldwide. Based on the feedback, we built a large database, reported the analyzed results, and created an interactive webpage for the map of global HF/E education programs. It is assumed that this global HF/E educational map can provide institutes

with comprehensive information to establish or further enhance their specific HF/E educational programs. Additionally, the professionals and students who need the information about the HF/E educational/training resources in their neighborhoods, regions, or even worldwide can find the information through this interactive webpage.

### **7.8.3.2 Collaboration with Asian Council on Ergonomics & Design (ACED) for H/FE education development**

To ensure that HF/E educational program development of IEA Federated Societies or their affiliates can align well with the IEA educational program guidelines, it is important to maintain good communication channel between ACED and IEA. The Professional Standards and Education Standing Committee extensively discussed the topics of ACED HF/E educational development and hosted a workshop/seminar together with the members of ACED. In addition, the Professional Standards and Education Standing Committee assist ACED in establishing its society constitution which is agreed with the IEA scope.

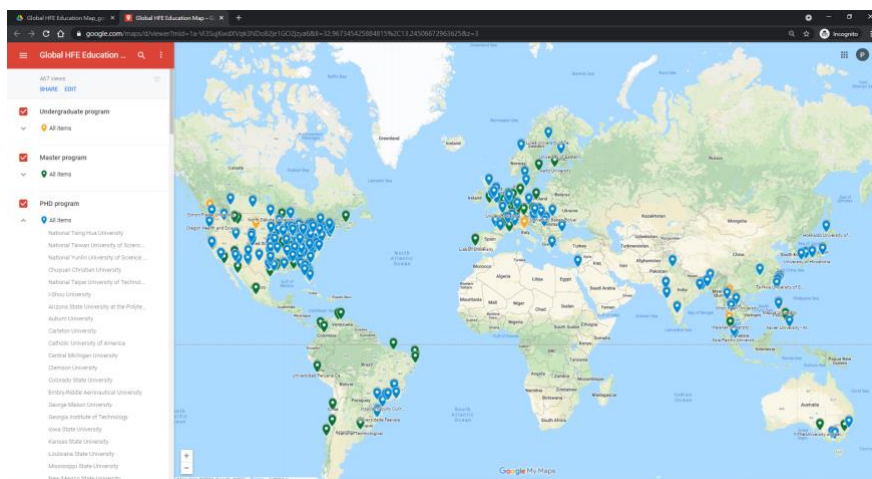
## **7.8.4. Activities and Outcomes**

### **7.8.4.1 Global HF/E Education: Map development**

HF/E Education information in Asia, North America, South America, Europe, and Oceania regions were collected and analyzed. A total of 43 countries were included. We set up an educational database with a total of 492 departments and 1331 faculties at this point.

All of the above information is published online in the form of an interactive webpage. Additionally, a mailing list of HF/E faculties from various areas in the world was developed. It is beneficial to deliver up-to-date information in the ergonomics field from IEA to researchers, scholars, and other professionals.

Two types of interactive interfaces have been developed. The Google Map system and the Google Earth system are shown below. Each pin on the webpage is an HF/E educational institute. An institute has information on at least one department or faculty. The pins with different colors stand for different degree levels provided in that department. The orange, green, and blue colors represent bachelor's, master's, and doctoral degrees, respectively.



**Figure 7.13. The global HF/E educational map on the Google Map System**



**Figure 7.14. The global HF/E educational map on the Google Earth system, part of data in the North America, Europe, and Asia areas as example**

We have visualized the database to develop the global map of HF/E education so that when a target region is selected, the institutions offering HF/E education and the relevant academics in the region will appear. The following is the up-to-date webpage link: <https://iea.cc/global-map-of-hf-e-education-programs/>. The database is continuously updated and expanded. Support for performing the data collection and translation is needed to overcome the challenges in connecting potential candidates to handle the various languages in different regions. We hope the development of this global HF/E educational map can provide easy access for users who need the information on HF/E education institutes, programs, and academics in various regions.

#### **7.8.4.2 Collaboration with Asian Council on Ergonomics & Design (ACED) for HF/E education development**

The IEA PS&E representatives brainstormed how to build a solid connection between international PS&E representatives through two pre-event meetings. Both initial discussions were held at the 5th International Conference of Southeast Asian Network of Ergonomics Societies (2018 Bangkok, Thailand) and Pre-ACED Meeting (2019 Hsinchu, Taiwan), respectively. We also hosted a workshop for ACED's "Seminar Retreat on Ergonomics Education Development" to further help ACED lay out a strategic plan in developing and promoting the HF/E educational system in the Asia-Pacific region. Effective communication and collaboration channels with ACED were established. The IEA PS&E representatives planned to attend the ACED meeting twice a year. However, due to the COVID-19 pandemic, the meeting schedule was affected. Therefore, the ACED meeting in 2020 was held virtually.



Figure 7.15 and 7.16. The ACED’s “Seminar Retreat on Ergonomics Education Development” in 2019

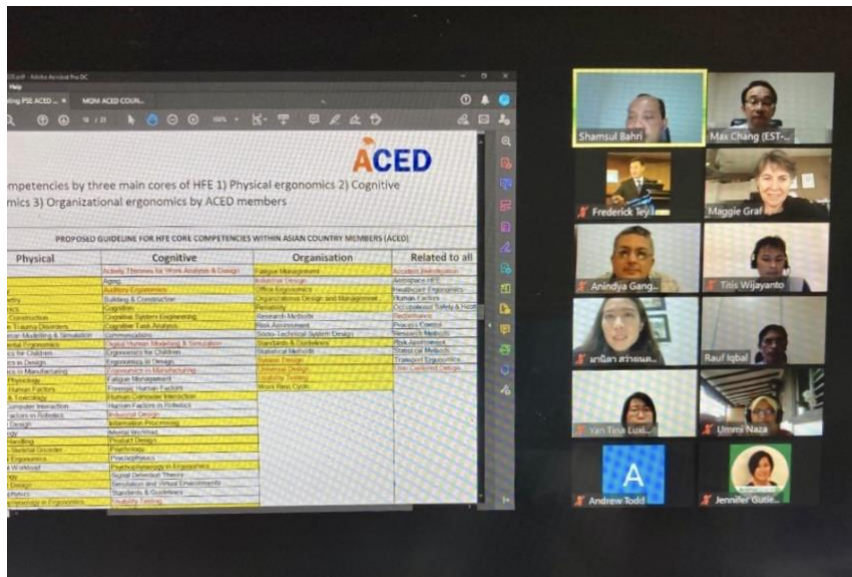


Figure 7.17. Screenshot of the online virtual ACED meeting in 2020

### 7.8.5. Summary and Recommendations

The documents and databases relating to international HF/E educational information are constantly updated. The Professional Standards and Education Standing Committee has been cooperating with IEA to get the education map officially established online. To see the currently available data we have collected so far, please check the IEA website.

The following recommendations are with regard to ongoing work:

- The IEA Executive Committee should help connect potential candidates who can effectively assist in data collection from other Federated Societies in various regions.
- Due to the various languages in different regions, language translation support for these regions will be needed.

### 7.8a. Certification Subcommittee

**Chair:** Maggie Graf

**Deputy:** Marion Edwin

The subcommittee includes representation from all IEA-endorsed certification systems on matters of mutual interest.

#### 7.8a.1. History

Following the update of all the procedural documents related to the IEA endorsement of certification systems, conducted during 2015-2018, the following needs were identified:

- The revision of the core competencies should be given a high priority.
- IEA should continue to encourage societies and regions (e.g., South America, Asia) or groups (e.g., BRICS<sub>plus</sub> Network Network) to establish certification systems.
- Societies that have established systems should be encouraged to apply for IEA endorsement.

#### 7.8a.2. Short-term Plan (2018-2021)

##### A review of the IEA Core Competencies

The IEA Core Competencies define the things that an HF/E practitioner knows and can do. This defines the profession and describes it to others. It is the framework for professional educational programs, and it sets the minimum academic and experience criteria for certification systems. The IEA Core Competencies document was first accepted in 2001 and has never been revised. Every major certification system had revised their criteria, and these had drifted from the older IEA model as it was no longer relevant to their needs. Emerging societies were calling for this type of support but also found the old model outdated. They also emphasize that the profession may fragment if we exclude too many practitioners, calling for more flexibility and adaptation to local needs. Most importantly, the proposals for the development of the profession (Dul et al.) and its added-value elements needed to be emphasized and included. On the other hand, the Physical/Cognitive/Organizational distinction needed to be less emphasized, as it had given rise to the erroneous view that HF/E professionals could be entirely specialized in only one of these areas. On the other hand, a specialization in particular areas of application, such as health and safety, product development, health care, transport, etc., is acceptable.

During the last triennial period (2015-2018) the first steps were taken to revise the Core Competencies. This was sent for comment to all certification boards, a number of educators from different parts of the world, and the IEA Executive. It was then presented at the 2018 IEA Triennial Congress in Florence in a workshop. The system of units and major elements was accepted by all, but a few points in the “performance criteria” were challenged, mainly with the argument that the Core Competencies do not need to cover the whole width of the field, and some flexibility should be allowed. The discussion was, however, principally about the type of further consultation. A Delphi Study was proposed. As the acceptance of the outcome by a broad range of members is desired, some form of further consultation appeared necessary. Additionally, references should be included to improve the understanding of the terms and some guidelines as to the required depth of knowledge in each area was requested.

The plan for 2018-2021 was to include the agreed units and elements into a booklet with auxiliary explanations to meet the diverse needs.

Four certification specific projects were proposed:

1. Review endorsement criteria to allow endorsement of more systems.

Several well-established and respected member societies have types of certification systems that do not meet the IEA endorsement criteria, particularly in regard to requiring membership for certification. Some of these are endorsed by local government agencies that require professional certification only through membership of these bodies. The aim of the project was to revise the IEA endorsement criteria that currently limit endorsement due to these factors and, if necessary, develop additional categories of endorsement such that systems that meet the IEA criteria in all other respects may be officially recognized by the IEA.

2. Promote mutual recognition of certification between endorsed bodies

The aim of this project was to propose guidelines so that HF/E specialists who are certified by an IEA-endorsed system (e.g., CREE) but work in a region that has another IEA-endorsed certification system (e.g., Japan) are able to acquire simplified regional certification in the new region.

3. Global extension of certification and IEA endorsement

A large number of IEA member societies have no certification system in place. This means that HF/E specialists cannot be certified locally. Several IEA-endorsed systems are open to people from other regions, but this is not widely known. Societies without certification would be encouraged to develop systems and given assistance to set them up. Additionally, the systems that had been endorsed by IEA many years ago and never reviewed would be asked to submit applications for reindorsement.

4. Develop a proposal for a “technical” or lower grade of certification

A number of certification systems have several levels of certification. Generally, these are intended to support new people entering the profession. Some societies have requested guidance on a lower-level qualification with possible specialization in a specific technical area. Although it is already possible for certification systems to have multiple levels within the IEA system, only the “professional” level gets endorsed. A system to permit endorsement of “specialists” should be investigated.

Without mutually accepted core competencies this project could not be advanced and won't be discussed here further. However, it will be recommended as a future activity.



### **7.8a.3. Strategic Design**

Both the revision of the IEA core competencies and the promotion of certification have strategic value, as these activities develop the profession, support the establishment of a professional identity, and equip practitioners for future needs. Certification enables the HF/E profession to maintain quality standards and protects clients from poorly qualified practitioners. Additionally, the core competencies can be used to present the profession to stakeholders and to assist in harmonizing training programs across the world.

### **7.8a.4. Activities and Outcomes**

#### **Updating IEA “Core Competencies” documents**

During the first two years of this executive term, the project was placed on ice so that it could be coordinated with two other projects that were proposed by other executive members. Both projects would have an impact on education. However, they were either dropped or substantially altered such that the final revision was undertaken in 2020. A booklet-style document was produced, which includes the agreed units and elements but also contains recommendations on implementation, with examples, a glossary of terms, text recommendations and other information. The IEA Executive gave feedback, and the document was revised on the basis of it. It was decided that further consultation would not be necessary, and the finalized revision will be sent to all societies prior to the 2021 Council meeting.

A presentation on the Core Competencies is planned for the IEA2021 Congress. This will take place in the Symposium “HF/E Education and Professional Certification Development.” At the IEA2021 Congress there will also be a special session on certification. This takes the form of a panel discussion on the issue of what defines HF/E practice. It is planned that this discussion will lead into a document to complement the Core Competencies but aimed at explaining the profession to associated professions and other actors.

Further projects:

#### **1. Endorsement criteria review**

It was decided at the 2019 Council meeting that a restriction of certification to members of the Society that developed a certification system would not be a sufficient reason to refuse IEA endorsement of it. Additionally, a complete separation of certification bodies from local societies is not necessary, as long as the quality criteria for professional certification bodies are otherwise met. These decisions did not require a change in the wording of the IEA endorsement requirements (as per 2016 revision) but did require a change in how the assessment criteria are evaluated by the assessors. The decisions of the Council were communicated in the Minutes of the Council meeting of August 2019.

#### **2. Mutual recognition of certification**

The document “Guidelines on Mutual Recognition between IEA endorsed certification bodies” was prepared and circulated to the IEA endorsed certification bodies. It is recommended that certification bodies adopt the practice of easing the certification of ergonomists from other systems, in that they do not required proof of educational competence when this has been assessed and

accepted by another IEA-endorsed certification system. Such candidates must submit an application as a renewal of certification, showing ongoing professional education and professional practice examples to demonstrate work over the last five years. Some certification bodies are not able to implement the recommendations due to local constraints (e.g., BCPE), however others have agreed to follow the principles (e.g., CREE). Some bodies require more experience than the IEA minimum requirement. In these cases, the local experience requirement will need to be met before recognition is granted to those from other regions. In all cases, familiarity with relevant local laws and institutions is required to be proven.

### **3. Global extension of certification**

1. A new Operating Procedure, including proposed changes to the costs for endorsement and re-endorsement, was approved at the 2020 IEA Council meeting.

The new fee system:

(1) First Endorsement: For certification systems with less than 200 certified people the fee is US \$150. For larger systems the fee is US \$250.

(2) Re-Endorsement: For all systems US \$100 plus US \$0.50 per certified person.

2. As at April 2012, there are seven IEA endorsed systems; those of Australia, Brazil (CisCEB), Canada, CREE (represents 14 certification bodies in Europe), Japan, New Zealand, and USA (BCPE). All have been either newly endorsed or re-endorsed within the last five years. CREE was approved for IEA endorsement according to the revised procedures in February 2018, and the certification body of the Brazilian Ergonomics Society was approved in July 2018. The CCCPE of Canada applied and was accepted in 2019. The Japanese Ergonomics Society applied for re-endorsement in 2019, and this was granted on the basis of the application received. A re-endorsement application form was subsequently developed and used by the BCPE (also re-endorsed 2019) and the Human Factors and Ergonomics Societies of both New Zealand and Australia, both re-endorsed early in 2021.

An application for IEA endorsement is in preparation from the South African Ergonomics Association, which has had an operational certification system for several years. Several other countries are known to have certification systems but have not applied for IEA endorsement and several others have certification systems under development.

Each of the reviews for endorsement was done with the assistance of reviewers from other IEA-endorsed certification boards. Many thanks for this assistance. In all cases two reviews were conducted independently, and the results compared. In no case was a further review required. Thanks go to the people who prepared such detailed and clear documents and rapidly answered the questions that were raised.

3. The new IEA website has information on certification under: About->What is Human Factors/Ergonomics-> Resources->Certification. This page shows the Criteria for IEA Endorsement of Certifying Bodies (as revised in 2016). At the bottom of the list of criteria there is a link to an endorsement application (as a pdf). Additionally, there is a section on "Endorsed Certification Bodies".

The list is headed:

"Certification bodies with IEA endorsement have been checked to ensure that they operate according to internationally accepted criteria for such bodies. Ergonomists who have been certified by the following certification boards at the professional level have all obtained an education in ergonomics at university level that covers the core competencies in ergonomics and have at least two years of independent profession»

Underneath these endorsed societies is a list of “Other recognized certification systems”. This group includes bodies who are known to certify HF/E professionals, but have not applied for IEA endorsement, so no formal review of their systems has been undertaken.

Certification bodies marked with a “+” on the IEA website accept applications from outside their society borders. This is an option that is currently available to members who have no local certification body. Where possible, certification bodies are encouraged to accept applicants from other regions.

#### **7.8a.5. Summary and Recommendations**

IEA documents and procedures relating to certification and education were revised and updated during the 2015-2018 term. No further action is necessary at present, although the revised Core Competencies document needs to be circulated to all members.

The following recommendations are with regard to ongoing work:

- IEA should continue to encourage societies and regions (e.g., South America, Asia) or groups (e.g., BRICS*Plus* Network) to establish certification systems.
- Societies that have established systems should continue to be encouraged to apply for IEA endorsement.
- Thought should be given to defining the core competencies for lower-level HF/E qualifications (e.g., basic HF/E for engineers, medical or therapeutic specialists, health and safety specialists)
- Although the members of the certification subcommittee are not defined, it has seemed sensible and practical to use the chairs of the IEA-endorsed certification bodies as consulting resources for the activities described above. It is suggested that this practice continues.
- Although there are some synergies with the educational activities of the Professional Standards and Education Standing Committee, in practice, the work of the subcommittee for certification is quite independent of it and requires different experience. The person heading the certification subcommittee requires quite a bit of experience in this area to perform the task effectively. The Chair proposes that consideration is given to separating these “hats” on the IEA Executive.

## 7.9. Science, Technology, and Practice Standing Committee (STP)

**Chair:** Thomas Alexander

Ergonomics and human factors have always had a close link to emerging research topics, growing availability and application of new, innovative technologies in practice, and general developments in society, especially referring to the future of work. Therefore, it is important to observe, analyze, and interact with these developments to assure that human factors/ergonomics (HF/E) keeps its core role for these developments and for future applications. The Science, Technology, and Practice (STP) standing committee addresses related topics, issues and challenges for HF/E.



### 7.9.1. Long-term Plan

The overall goal of the Science, Technology, and Practice Standing Committee (STP) is to foster developments in these areas for the domain of Ergonomics and Human Factors. It supports the general exchange of information and knowledge between different organizations, institutions and individuals (seniors, experts, novices, and students) at an international level. This way it provides an overview about the scientific and practice knowledge and environment of Ergonomics and Human Factors on a global scale. STP identifies new, upcoming and emerging topics within our domain and adjacent domains. This allows a fast consideration of innovative technologies and systems for, e.g., advanced human-system interaction and new ideas for our domain.

The 27 Technical Committees (TCs) are a well-established base for providing an overview about developments in our domain. They provide a structure for a network of international experts with different backgrounds sharing enthusiasm for their specific topic. The STP Standing Committee maintains the general oversight and promotes the activities of the different IEA Technical Committees (TCs). It supports their activities and their work. This way it is possible to reach back on a global network of experts, developers, and practitioners – typically including experts and novices from academics, research institutions, federal offices, and industry. The members of a TC have different backgrounds in natural science, social science, engineering, computer science, and psychology (to name just a few examples). This provides a comprehensive, interdisciplinary picture of the situation, which is one of the characteristics of STP. It also supports a systematic advance of scientific knowledge based on profound knowledge and competences about ergonomic methods, means and technologies.

STP generally follows two different approaches: On the one hand, it addresses current developments and challenges for Ergonomics and Human Factors. This refers to “traditional” ergonomic topics, e.g. anthropometry, workload or design. On the other hand, it refers to innovative technical issues and, thus, new technologies and their impact on Ergonomics and Human Factors. This includes new topics and applications, e.g., in healthcare, robotics or automotive. Both approaches represent the broad bandwidth of topics and objectives of the different TCs.

A close connection to the application is essential because Ergonomics and Human Factors have always been application-oriented. It is not a typical academic domain for a small group of people but very closely linked to practice. This is also important because nowadays many developments have been originally initiated by new technical feasibilities. New developments in digitalization, sensor technology, communication networks and, in general, information technology or engineering enabled and are still enabling new types of applications, ways of communication and cooperation. This has large impact on our private or professional life. The introduction of new technology and new feasibilities always affects humans in their different roles as operators and users, but also as planners, constructors, mechanics or maintainers. A successful introduction requires a thorough

consideration of relevant human characteristics and capabilities into consideration and, thus, a human-oriented system development approach. Such a system-oriented and interdisciplinary approach is the general goal of STP and the TCs.

In addition to their thematic work, the TCs also support the planning and organization of activities for the IEA Triennial Congresses (e.g., by inviting contributions, providing expertise to the review of contributions and moderating sessions in the specific track), the organization of international conferences and the management of additional seminars and/or expert meetings for a larger audience.

### **7.9.2. Short-term Plan (2018-2021)**

During the recent three years, STP has initiated and executed new internal and external actions together with the members of the Executive Committee and the TC community. This included forming a baseline structure for the dissemination of information and knowledge, for good scientific work of excellent quality and still leaving maximum freedom for innovation and creativity. It also established cooperations with other domains in relevant innovative topics.

The three-year plan included four major items:

- Support the IEA Triennial Congress as a premier event in the area of HF/E
- Expand IEA's interdisciplinarity and reputation within and outside the IEA network
- Support the IEA community as a global forum
- Work on a new "IEA Handbook of Ergonomics"

It is obvious that working on these items required a close communication and collaboration with other members of the Executive Committee, the organizers of the IEA 2021 Triennial Congress and the chairpersons of the TCs. Changes and the need for fast adjustments have been a characteristic of the recent years. This referred to upcoming topics (e.g. artificial intelligence, robotics) and operational adjustments, which will be addressed in the following chapters.

Several adjustments were a consequence of the Covid-19 pandemic. It resulted into several external and internal challenges for STP. Among others, travel restrictions and limited personal meetings made personal exchange of knowledge and building new networks very difficult. As a consequence of the pandemic, most scientific conferences were either cancelled (1<sup>st</sup> half of 2020) or reduced to online presentations and webinars (2<sup>nd</sup> half of 2020 until now). This impeded open, free discussions or networking between members of a TC. Several conferences, workshops or meetings with TC involvement were cancelled as well. However, the situation also introduced new formats (e.g. webinars) for the dissemination of our results and findings. This should be extended in the future.

### **7.9.3. Strategic Design**

The support of the IEA Triennial Congress started at the beginning of the term by early talks and discussions with the organizers of the IEA2021 Triennial Congress. Lessons learned and experiences from previous Triennial Congresses showed that an involvement of TC chairs and experts from the very beginning is essential for a high scientific quality and excellence of the presentations. Consequently, the congress organizers involved STP, the TC chairpersons and experts from the HF/E community throughout the total planning, organization, and preparation process.

Reaching out to other communities has significantly been affected by travel restrictions and event cancellations. Consequently, it was not possible to increase the number of endorsed conferences. In terms of cooperation with other organizations, existing cooperations were established and a small number of new contacts were initiated.

Supporting the IEA community refers to other members of the EC and the TC chairpersons. Different actions were carried out to structure the operation of the TCs and provide information. Two

additional members supporting the STP chairperson also extended the STP standing committee. It is recommended to continue this in the next term.

Finally, the work on the new *Handbook on Human Factors/Ergonomics* has been specified and first discussions with experts as potential contributors have started.

#### **7.9.4. Activities and Outcomes**

##### ***Support of IEA Triennial Congress***

Cooperation with the organizers of the IEA Triennial Congress is a main task and possibility for STP and the subordinate Technical Committees. This involves planning, organization, preparation, reviewing and management of the scientific contributions. Experts from TCs provide the thematic background and contribute to the thematic orientation and acceptance of potential contributions. Thus, they support the overall excellence and high scientific quality of the event. Typically, TCs were getting involved in the last year before the congress. It has been different with the IEA2021 Congress: First discussions about lessons learned and the general way ahead between STP and the organizing team took place three years ago, at the recent 2018 IEA Triennial Congress in Florence. These open and successful discussions provided the base for a general schedule and plan for the preparation process. During the following progress, the STP chairperson still served as an interface between TCs and the organizing team for general issues and topics, but communication to the TC experts happened directly.

The contact between the IEA 2021 program committee, Nancy Black and Patrick Neumann, and TC chairpersons started in 2019 and continued in different virtual formats during the following years. The thematic structure of TCs provided a thematic background of the congress. Introducing online formats like web-conference and an online-conference management system that were known by the majority of experts kept the TC experts involved and committed. As a matter of fact, both, process and format, were very successful to cope with the changing requirements during the pandemic. STP and TCs experts were also invited to contribute by additional formats, e.g. moderating special panel sessions, endorsing special issues of journals as a parallel activity or submitting ePosters to introduce and advertise their TCs. The communication and cooperation have been very open, productive and fruitful.

##### ***IEA interdisciplinarity and reputation***

The domain of human factors/ergonomics is generally interdisciplinary and application-oriented. This means that TC members usually have a background in a broad range of topics, e.g. psychology, engineering, computer science, medicine. This results in multiple links to other domains and thematic groups. Consequently, TCs and their member presented their results at national and international conferences within other domains. These conferences were often focal points in these other domains and provided an excellent forum for learning about future developments, ongoing research and actual results in thematic areas beyond Ergonomics and Human Factors.

A good example for this is the successful collaboration of TC Human Factors in Robotics and the IEEE ARSO2021 conference. TC HFIR has been founded three years ago and has established a fruitful exchange of knowledge in the field of robotics / AI between IEA and IEEE. As a consequence, the so far technology-oriented conference does not only address technical issues and topics in this domain but also topics from Ergonomics and Human Factors.

STP and other members of the EC also reported their activities annually to ISO/TC159. This is a solid base for future collaboration. Still, many experts are involved in ISO and IEA activities. These experts might be “ambassadors” in both groups.

During this term, the following events applied for and received IEA endorsement:

- Humanizing Work and Work Environment - 19<sup>th</sup> international conference of the Indian society of ergonomics. 1.-3.12.2021. Guwahati, India.
- IEEE International Conference on Advanced Robotics and its Social Impacts (ARSO) 2021. 08.-10-07.2021. Virtual Conference.
- Annual Meeting of the Indian Society of Ergonomics, HWWE2020, 10.-12.12.2020, Mumbai, India.
- International Ergonomics Conference – Ergonomics 2020, 02.-05.12.2020, Zagreb, Croatia.
- ACED SEANES 2020, 02.-04.12.2020, Bohol, Philippines.
- 13<sup>th</sup> Int. Symp. on HF in ODAM, CIEHF, (26-29 Jun 2020) 28-29 Apr 2020, virtual.

In addition to endorsement of events, STP cooperates with the IEA EC in order to update the endorsement criteria and process for HF/E-related journals.

A major point was the collaboration with the conference Beyondwork2020, the 2020 European conference on labor research in Bonn, Germany, from 21 until 22 October 2020. The conference took place in the context of the German Presidency of the Council of the European Union. Topics of relevance for the future of work were presented and discussed in an online format. They included topics related to health and prevention, networks at work, humans and machines, interactive work, participation and leadership, regional and global change, skills management and the cross-topic area of artificial intelligence. IEA EC and STP have supported the event during multiple virtual meetings together with GfA and FEES, and organized a session on Ergonomics and human factors in today's and future's labor – a global perspective. The results will be integrated in a new European research programme about the future of labor and work. By their involvement in the conference, IEA assured that our topics will be considered appropriately.

### ***IEA Community***

The recent term has been characterized by several changes within the STP TCs. Still, the 27 Technical Committees represent a major part of the IEA community and address a broad spectrum of Ergonomics and Human Factors topics. At the beginning of the term, 12 new persons have been elected as TC chairpersons. This came along with a new start of several activities and a re-structuring of the TC system. It also required merging inactive TCs with more active ones. This process is still ongoing and several TCs are suffering from a small number of participants. STP has asked the IEA EC and the federal societies to help recruiting new experts. In addition, a regular, quarterly STP-newsletter has been introduced in 2018 and 2019 in order to support information exchange between the different TCs. But resonance from the TCs has been limited so that it has been stopped in 2020.

The publication of guidelines for new TC chairpersons has helped the new persons to get used to their new role. The guidelines address many open questions about the purpose and role of a TC, requirements for a membership in a TC, the general role of a TC officer, elections and nominations, business meetings and reporting. However, the handbook with guidelines should still provide broad freedom for independence and creativity. This is a basic requirement for good scientific research.

In order to foster scientific exchange between the TCs and discuss new ideas for STP, it has been proposed to the EC to introduce additional co-chairs (deputy) to STP. The EC and council have supported this idea. In the following, Rosemary Seva (De La Salle University, Philippines) and Andrew Thatcher (University of the Witwatersrand, South Africa) joined the STP standing committee. Both are renowned experts in ergonomics and human factors and have chaired TCs for many years. For

the future, Thomas Alexander continued as overall chairpersons, POC for the EC and external affairs (including endorsement). Rosemary Seva agreed to monitor and organize the TCs. Andrew Thatcher volunteered to be responsible for the further development of the handbook of Ergonomics and Human Factors. It is highly recommended to follow a similar approach of shared responsibilities for the next term.

### ***IEA Handbook of Ergonomics and Human Factors***

The work on the new handbook of Ergonomics and Human Factors has started but is not finished. One reason for this is that the preparation of handbooks and encyclopedias with nearly identical content and scope have started in the meantime. This led to new consideration of the objectives and scope of the IEA publication to prevent a pure replication. After a consultation with experts from the Ergonomics and Human Factors domain it was clear that the original structure of a multiple volume publication would largely overlap with the other publications. As a result, the idea for the last volume (working title: “ergonomics in a nutshell”) was recommended to follow because the topic and scope did not overlap. Consequently, this idea was discussed in a smaller group. As a result of this discussion, the new IEA-handbook should address Ergonomics and Human Factors topics with high relevance for practice and application. Rather than a single book it would make sense to produce three different types of publication. They can address three different target audiences: (1) leaders of larger organizations or policy makers responsible for strategic decisions, (2) business managers responsible for executing policy in organizations, and (3) worker organizations addressing worker’s health and well-being. The first publication would address leaders of organizations and can introduce and explain how Ergonomics and Human Factors can help them preparing and managing their business strategy. This would be of great benefit for many users, who are more interested in solutions than in scientific background. Discussions with potential authors have started and should be continued in the next term.

### **7.9.5. Summary and Recommendations**

A single word to characterize the recent three years would be the term “change”: There were several changes in TC leadership; STP has additional co-chairpersons; there has been a new process for TC-involvement in the Triennial World Congress etc. But still, many things are the same. Among others, there is a clear description of roles and responsibilities of TCs available. TCs still provide expertise and competence. The organization and support of the Triennial IEA World Congress has been very successful, and an outreach to other organizations has first fruits.

During this term, the STP Chair’s ambition was not only to advance new topics for Ergonomics and Human Factors, but also to focus on the core element of our domain: The humans, the experts and HF/E enthusiasts who seek to enhance health and human well-being on a global scale. All activities follow the goal to foster IEA’s reputation in science and technology and to make the IEA community a global forum for fruitful and open-minded discussions.



## 7.10. Ad Hoc Committee: Future of Work Task Force (FoW)

Juan Carlos Hiba, Chair  
Klaus Joachim Zink, Co-chair



### 7.10.1 Rationale, objective and main aims of the Task Force Future of Work (TF FoW)

The future of human factors/ergonomics (HF/E) and the future of work are interdependent. The systemic evolution and dynamic linkages of these two concepts and our capacity of understanding how these processes of change occur is essential for the HF/E community. Changes occurring in the working world need systematic and thorough follow up from HF/E. The HF/E community needs to pay attention, be aware and continuously be updated about labour changes and innovations occurring in the world of work.

Our discipline, its researchers and practitioners can contribute to a more humane and dignified world of work for everyone, even in the face of new COVID-19 risks. Our contributions for molding the future of work we want should be guided and sustained taking into due consideration well known and innovative HF/E values, principles, concepts and approaches. All these need to be used as beacons and guidelines in HF/E research, HF/E scholar activities as well as through HF/E professional activities.

The overall objective of this ad-hoc Task Force (TF) is to identify and capture changes and trends driving the future of work and help HF/E to be as prepared as possible to respond effectively to those labour changes and help shape that future.

The main aim of this TF is inspired two milestones:

Firstly, the two directives recommended by Dul et al. in the report *"A strategy for human factors/ergonomics: Developing the discipline and Profession."* *Ergonomics*, 2012:

First directive: "Strengthen the demand for high-quality ergonomics by raising awareness among stakeholders about the value of high-quality ergonomics by better communication with stakeholders; building partnerships with them; and educating them."

Second directive: "Reinforce the application and use of high-quality ergonomics through promoting the (continuing) education of specialists in ergonomics; ensuring that ergonomists provide the highest-quality services (methods, standards and procedures) and that in universities and other institutions (HF/E associations?) to promote the development of research excellence in ergonomics."

With respect to the first directive above, the progressive synergy process as led by the international team focus on better communication and relationship between IEA and its member societies with ILO, creating opportunities to provide to ILO staff around the world with a better and broader understanding of values, principles, approaches, tools, and scope of HF/E, and later organizing joint activities and programs.

Concerning the second directive, the responsibilities of each member of the TF is to promote through HF/E Observatories to seek, detect, and disseminate data and information gathered from different sources related to trends, changes, and innovations occurring in the world of work and of HF/E interest affecting, influencing, or benefitting workers. These data and information should be distributed through the most efficient ways for reaching our members of the HF/E community worldwide. The intent of the HF/E Observatories is to systematically improve knowledge, capacity and skills in research, academic, and/or professional HF/E activities.

The second important milestone guiding our Task Force activities stems from the International Labour Organization <sup>3</sup>, specifically from the statement by Guy Ryder, ILO Director-General when launching ILO's Centennial Initiative on the Future of Work: "Beyond our personal opinions or wishes, the real circumstances that the world of work will face are and will be the result of a number of decisions, public and private, national and international, related to all aspects of the policies that regulate or affect the world of work. We must understand that the future of work must be forged with human actions and not simply left to the forces of technology, the globalization of economies or other external factors. The challenge is to make it what we really want."

Our Task Force projects, therefore, focus and try to help to our HF/E community to responding the following questions: How do we as human factors/ergonomics directives, researchers, scholars and practitioners want to see the future of work? How can we contribute to shape future jobs and employment posts and therefore the future of work?

In the Task Force we believe that to undertake the above global labour challenges our HF/E community internally needs to work through closer interactions among our Networks and affiliated and federated societies, as well as externally creating strong, sustainable alliances with the real players of the working world, i.e., governments, employers and workers organizations. Continuing relationship with ILO is essential and should be considered an institutional priority for IEA, its Networks and each federated and affiliated society.

#### **7.10.2. Long-term Plan**

What does it mean to pay attention to the future of work from HF/E perspectives? We propose the following directions giving shape to a long-term plan:

- (1) Detecting trends in new types of employment and work, identify new risks and report changes in working conditions and inform the HF/E community on news and innovations that affect worker well-being and system performance;
- (2) promoting HF/E values and principles and design work systems and, even more important, play our part to shape a future of work that is both different and better; and
- (3) developing HF/E initiatives between the HF/E community and the three main actors (governments, employers and workers organizations) from the world of work promoting decent work as defined by the ILO.

#### **7.10.3. Activities and Outcomes**

Our Task Force current activities are structured in four projects:

- (1) Improving our Task Force Future of Work structure and operations;
- (2) Interventions and promotional materials on HF/E and Future of Work;
- (3) A proactive HF/E approach and activities on future of work issues; and
- (4) Promoting HF/E Observatories operating worldwide.

---

<sup>3</sup> The ILO is the only tripartite U.N. agency; since 1919 this organization brings together governments, employers and workers of 187 member States to set labor standards, develop policies and devise technical cooperation programs promoting decent work for all women and men<sup>3</sup>. Its motto is "Advancing social justice and promoting decent work". The main aims of the ILO are to promote rights at work, encourage decent employment opportunities, enhance social protection and strengthen dialogue on work-related issues. In 2015 ILO launched its Future of Work Centenary Initiative. The "human-centered agenda" recently outlined by the ILO Global Commission on the Future of Work report (2019) highlights HF/E key issues related to people's capabilities and decent and sustainable work for a brighter future of work.

## **Project 1. Improving Task Force FoW structure and operations**

The main activity of this project was to prepare a short paper of TF FoW aim & purposes (ready for publishing into new IEA website). This paper was distributed along the period to interested persons.

In several conferences and workshops where we participated along this period we reported about the existence of our Task Force.

The main outcome in this period of this project is the recruitment of Dr. Klaus Zink as a co-chair. The cooperation and proposals from Klaus Zink have been very important for this final stage of the TF.

We received other consultation about the Task Force from an Asian country but with no results.

Therefore the possibility of increasing the TF members with representatives one each from Oceania, Asia and Africa is still to be accomplished.

## **Project 2. Interventions and promotional materials on HF/E and Future of Work**

The main activities carried out in the period were:

- Personal work. Presentation. “El futuro del trabajo y la mirada de la ergonomía: desafíos y perspectivas”. Cali. March 2019.
- Presentation. “Future of work and future of HF/E - Views and perspectives from the UK”. Ergonomics and Human Factors Conference 2019. CIEHF. Stratford Upon Avon. In cooperation with Kathleen Mosier. May 2019.
- Personal work. Contribution to IEA/ILO publication “Principles and Guidelines for (HF/E) Design and Management of Work Systems”. JC Hiba.
- Tripartite Forum: “Ergonomía al alcance de todos en el siglo XXI”. VI Latin American Ergonomics Congress, Buenos Aires, November 2019. JC Hiba is the organizer.
- Short paper. “The Essential Contribution of Human Factors/Ergonomics to the Future of Work We Want”. In collaboration with K. Mosier. ILO. Geneva.
- Workshop “How to encourage the development of research and practical applications of high quality HF/E in Latin America”. VI Latin American Ergonomics Congress, Buenos Aires, November 2019. In cooperation with Andrew Todd, IEA International Development Committee. This activity was developed both in English and Spanish. (An appraisal in English of the outcomes is available).
- Personal work. Translation and editing into Spanish of IEA/ILO “Principles and Guidelines....”. In cooperation with ULAERGO. JC Hiba. October 2020.
- Personal work. Translation and editing into Spanish of “7 tips on telework” from JES. In cooperation with ULAERGO. JC Hiba. November 2020.

Foreseen activities in 2021:

- Discussion Session\_– “HF/E global strategies and activities contributing to mold the future of work we want”. In cooperation with Klaus Zink. Accepted in 2021 IEA Congress in Vancouver

- Symposium of IEA experts\_– “HF/E values, principles and approaches contributing to mold the future of work we want”. In cooperation with Klaus Zink . Accepted in 2021 IEA Congress in Vancouver.
- E-poster with results of the global survey on the future of work in IEA 2021 in Vancouver.

### **Project 3. A proactive human factors/ergonomics on the future of work**

This TF initiative is based on Dul’s et al second directive.

The main activity carried out in the period was the organization of a global survey through a questionnaire titled “Main world of work trends and HF/E initiatives related to the future of work in IEA’s Networks and Societies”. In cooperation with Klaus Zink.

This questionnaire was distributed to all IEA’s federated societies and Networks in February 2021. Up to April 12th 2021 a total of 37 responses were received. We want to thank specially the cooperation of Dr. Harald Weber, Director of Institut für Technologie und Arbeit (ITA), (Institute for Technology and Work), Kaiserslautern/Germany for offering its institutional website as a repository of answers to the questionnaire.

Many thanks also to Kathleen Mosier, Lynn Strother, Carlos Espejo, Elina Parviainen and José Orlando Gomes for their support and cooperation at different stages of the initiative.

The Networks and societies responses to the questionnaire are currently under analysis and it is expected to offer the outcomes through an e-poster in IEA 2021 in Vancouver.

### **Project 4. Promoting HF/E Observatories operating worldwide**

This TF initiative is based on Dul’s first and second directive as well as on the statement of Guy Ryder, ILO’s Director General, as stated above.

Its main activities during this period were:

- Conceptual paper describing this initiative: HF/E Observatories’ aims, scope and role. Available in Spanish and English.
- Continuous testing of the idea of designing HF/E/OSH Observatories through academic exercises with local postgraduate students at University of Rosario, Argentina. (In progress).
- A proposal for founding an HF/E Observatory at the University of Rosario. (Under current consideration of university authority).
- Pilot dissemination and consultation in different world regions. (in progress)
- HF/E Observatory being created in Chile - Chilean Society of Ergonomics. (in progress).

The final outcome of this initiative is to provide a tool for HF/E community to capture and disseminate global labour phenomena affecting the world of work from a HF/E perspective through their local HF/E societies.

#### ***Establishing contacts and relationship building.***

With the intent of building on the existing relationship with ILO, contacts were established with Ms. Mariluz Vega, Head, ILO’s Future of Work Team. We planned and co-organized the meeting of IEA delegation in Geneva for establishing closer contacts with ILO representatives in ILO’s Geneva

Headquarters in February-March 2017. We participated in a joint interview with two ILO officials of the ILO's Future of Work Team. In Geneva, the TF participated in the ILO "Future of Work that We Want" global dialogue and made informal contact with ILO's Director General with the intent of inviting him to address IEA2018. Other ILO contacts established include Ms. Carmen Moreno, Head, ILO Representative for Workers Activities based in Lima, and Mr. Philip Van Huynegem, Director ILO Office in Lima for the Andean Countries. The TF requested ILO's cooperation for the Special Cuatripartite Session on "Ergonomics and the Future of Work" to be held at the 23th Semana de la Salud Ocupacional and Medellín, Colombia, September-October 2017. The TF also contacted the ILO Office in Buenos Aires, requesting their cooperation in the Special Cuatripartite Session on "Ergonomics and the Future of Work" in the Argentine National Congress of Ergonomics, February-March 2018, coordinated activities with Ms. Marta Luengo, local contact in Neuquén city, and organized a special session on *Ergonomics and the Future of Work*.

#### **Participation and presentations at related events**

The TF Chair participated in special sessions focusing on the Future of Work in several international conferences and meetings, including: the Brazilian Association of Ergonomics Congress in Porto Alegre, September 2017; the special meeting of representatives of ergonomics societies belonging to BRICS countries, September 2017; the Special Cuatripartite Session on "Ergonomics and the Future of Work," Colombia. 1-4 November 2017, co-organized with ILO's official Mr. Italo Cardona; and the Asociación Uruguaya de Ergonomía - AUDERGO –(Uruguayan Association of Ergonomics), Uruguay, December 2017.

#### **Papers**

The TC Chair completed several papers discussing the relationship between HF/E and ILO, the impact of HF/E on the future of work, and potential activities to be considered. Titles include *Exploring potential synergies between IEA and ILO based on their similarities*, *Lista de posibles temas y modos de interacción entre IEA y OIT en América Latina y el Caribe* (A list of topics and possible ways of interactions between IEA and ILO in Latin America and the Caribbean, *Designing an ad hoc IEA Task Force on the Future of Work*, *Ergonomics Observatories - First ideas about their raison d'être, operation and results*, and *A White Paper on Ergonomics and the Future of Work - First proposals about it "raison d'être," structure, and usefulness*.

The most important written product of the TF will be a White Paper to raise and enhance the interest of the ILO in HF/E through learning its definition, apprehending its meaning both as science and as technology, understanding its principles and values, and appreciating its scope of action and wide fields of interest. The intent is that ILO will be more prone to include HF/E approaches and tools in future ILO activities.

This White Paper will give, in this case, evidence of our strong intention to open the HF/E doors, sharing our knowledge with ILO and contributing to ILO stakeholders through the ILO Future of Work initiative and later through other joint initiatives. Expert contributors from more than 20 countries have been identified, and a draft of the White Paper will be presented at the 2018 IEA Council meeting.

#### **7.10.4. Summary and Recommendations**

This new ad hoc TF on the Future of Work should be considered under slow construction. We have designed these four projects for broadening the ways through which our HF/E community might expand our scientific and professional contribution to the global/local societies, as well as increase our own knowledge of what is happening in the working world and, consequently, how to react proactively to those job changes and work practices and innovations.

The future role of this Task Force will depend, in part, of the success of the coming outcomes of the survey on “Main world of work trends and HF/E initiatives related to the future of work in IEA’s Networks and Societies” and, to what extent these outcomes are a source of inspiration to continue our activities in the next period.

The questionnaire in Project 3 and this initiative for creating HF/E Observatories are singular proposals that, if they bloom, would certainly give continued life to the TF. Its continuity, however, partially also depends on how these two first proposals are received and accepted by our HF/E community and, if they are accepted, to what extent the HF/E community understands their benefits, and whether the HF/E community is proactive and persists in their implementation and sustainability.

Further exchange of ideas and proposals until June 2021 are most welcomed. Please contact Juan Carlos Hiba, Chair, to [juan\\_hiba@yahoo.com.ar](mailto:juan_hiba@yahoo.com.ar) and Klaus Zink, Co-chair, at [k.j.zink-kl@t-online.de](mailto:k.j.zink-kl@t-online.de).

## 7.11. IEA2021: HF/E in the Connected World

21st CONGRESS OF THE INTERNATIONAL ERGONOMICS ASSOCIATION

Y. Ian Noy, Organizing Chair



### 7.11.1. Introduction

This brief report summarizes the planning challenges and decisions taken during the development of IEA2021. Specifically, it covers five main topics: Venue, Administration, Technical Program, Promotions and Communication, and Sponsorships & Exhibits.

### 7.11.2 Venue

We briefly chronicle the transformation of the Congress from an in-person event to a Hybrid event to a Fully Virtual event, a transformation made necessary by the devastating and relentless COVID-19 pandemic that is still raging at the time of writing.

#### Planning the In-Person Congress

The Congress venue was selected after a detailed site evaluation of contending hotels and convention centers from 5 major Canadian cities (Montreal, Halifax, Toronto, Calgary, and Vancouver), based on assessments of ease of travel and accessibility, destination attractions, hotel meeting capacity and capability to support large conference logistical needs. Although the ACE bid proposed Banff as the Congress venue, it became clear early in the process that it neither met the capacity nor accessibility criteria to be suitable for a major international meeting. The Hyatt Regency in Vancouver was deemed the most suitable venue bolstered by the fact that Vancouver is a superb meeting destination (voted as most popular convention city in North America). It was to serve both as the Congress conference HQ and principal hotel accommodation. Bedroom rates were negotiated at favorable levels, though admittedly Vancouver is an expensive city. In addition, student accommodations were to be arranged at the University of British Columbia housing. The hotel meeting facilities could accommodate upwards of 1600 delegates and the entire hotel meeting space was booked for the week of the Congress plus the previous weekend in consideration of a guaranteed bedroom block and minimum Food and Beverage spend. There was no charge for meeting space provided we fulfilled the room block. Between 11 and 13 concurrent meeting rooms holding at least 125 delegates theatre style were available in addition to smaller rooms for ad hoc meetings or ancillary gatherings (some of the rooms could hold upwards of 400 delegates).

#### Conversion to Hybrid Congress

As the COVID-19 pandemic began to spread internationally in March of 2020, major disruptions to travel and meetings were instituted worldwide. From the Congress planning standpoint, the expectation during the spring and summer of 2020 was that the pandemic would come under control and not affect the Congress, which was more than a year away. The priority at the time was to develop the Technical Program and the strategy was to develop delivery plans that would be flexible and respond to the situation as it might unfold. However, as summer months continued to ravage the global health system there was increasing concern over accessibility for hard-hit countries or economic sectors, we began to explore the possibility of introducing a satellite virtual conference.

In July, 2020 we announced:

**IEA2021 will be a hybrid event, comprising both an in-person conference and a virtual conference.** Plans for the in-person conference are going exceedingly well and we are confident we will deliver a dynamic, enriching and memorable experience. The Congress will comprise 5 days of technical content, including plenary sessions at the start of each day followed by 12 concurrent sessions. We have also added ePosters to enhance the traditional

poster boards. The ePosters will be dynamic, supporting several presentation formats. Times for interacting with the authors will be posted, but the posters will be available on your mobile app during the Congress and for 30 days afterwards. We believe this initiative will promote greater interaction and will have great impact.

Going hybrid will allow people who, for a variety of reasons, will not be able to join the in-person conference in Vancouver to participate in the most important human factors and ergonomics conference of 2021. As such, this initiative will take the IEA mission to elaborate and advance ergonomics science and practice while expanding its scope of application and contribution to society to a whole new level. We are introducing the virtual conference as an integral part of the Congress, but it will have more limited technical content than the in-person conference. The virtual conference will have up to 28 unique webinar-style sessions, compared with about 144 sessions of the in-person conference. The plenary sessions in Vancouver will be live streamed to the virtual conference delegates.

Registration fees will be reduced to make the virtual conference widely accessible. And, virtual session delegates will be able to join the online webinars at scheduled times to pose questions and interact with the authors. The recorded virtual sessions will be available on demand for 30 days post Congress. In-person delegates will have full access to the virtual conference as well as the in-person conference.

The main body of the Congress will be the in-person conference. We urge everyone to submit proposals for lectures or ePosters and plan to attend the in-person event. It will be truly unforgettable! Nothing can really replace the in-person experience.

### **Pivoting to Online Virtual Congress**

Although pressure was mounting in the fall of 2020 to go fully virtual, we were contractually obligated to the Hyatt Regency. The contract contained a Force Majeure Clause that would allow canceling the contract for a variety of reasons beyond our control, including a pandemic. However, invoking this clause needed the consent of the hotel to avoid the very hefty cancellation penalty. In November of 2020, we agreed with the hotel to make the final decision on March 1, 2021, and that we would be allowed to cancel the event without penalty at that point if the situation did not improve or continued to jeopardize the viability of the Congress. So, while we began to work on pivoting to a fully virtual Congress, we continued to promote the in-person event so that we would not affect registrations if indeed the in-person conference was to take place.

We encouraged registration for the in-person event and established policies that ensured that no one would be penalized if they registered for the in-person event and we later pivoted to a virtual Congress (they would receive refunds). We also developed a Frequently Asked Questions and Answers document to help explain the Hybrid model as this was new to the IEA, if not to most scientific conferences.

However, in early February, it was clear that the situation in Canada and internationally would not improve before June and a decision was needed prior to the March 1 decision date as delegates needed to plan their participation. Accordingly, on February 8 we contacted the Hyatt to explain our predicament with the result that the hotel agreed to release us from the contract and to refund the deposits that had been paid to secure the meeting space. This marked a major change in direction for the Congress and it allowed little time to deal with the myriad of the technical program adjustments that were necessary or the many exigencies associated with building a large virtual conference.



## Software Platforms

To plan and execute the virtual Congress, five main software platforms were utilized as illustrated in the figure below. It was necessary to consider how information would be shared across the various platforms, though this turned out to be a major impediment that was not adequately addressed during the selection of the products. With hindsight, perhaps different products would have been selected. However, at the initial stages the detailed technical capabilities and limitations of the various software platforms were not fully known/appreciated. Despite having worked out the data flow needs across platforms (see Figure 7.18) it was not possible to test the way this might be accomplished prior to acquiring the products. Moreover, it should be noted that the technologies for delivering virtual events was in a constant state of flux and improving. In the end, it turned out that transferring information across platforms required much manual manipulation that was prone to error, requiring tedious quality checks and several iterations. Even within a given platform such as EasyChair, certain elements of the software were not accessible to other elements.

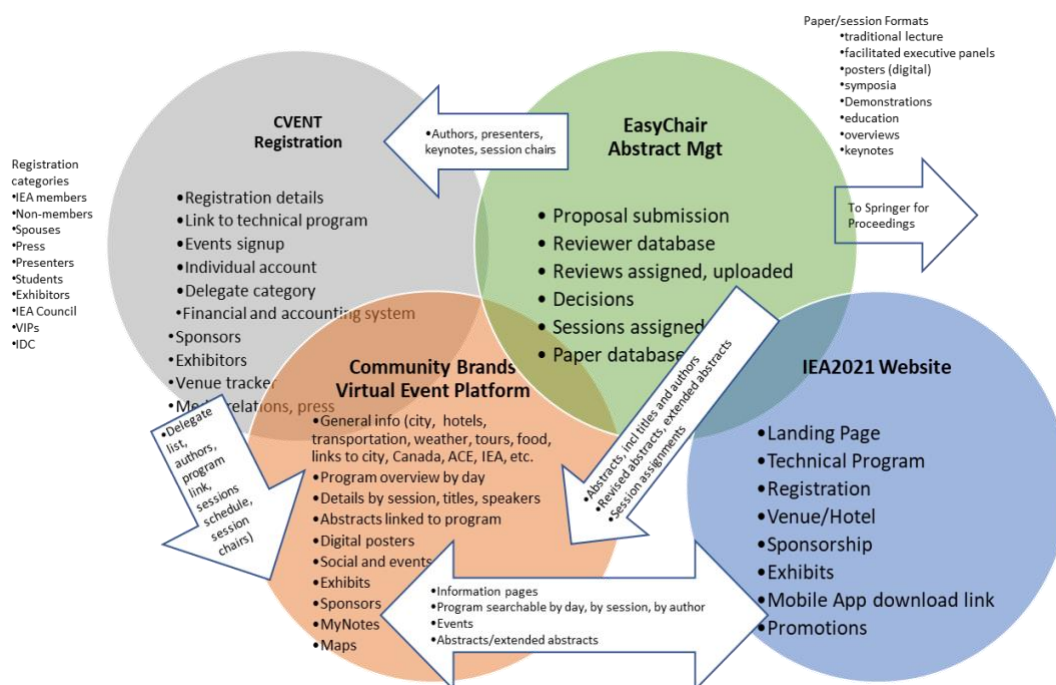


Figure 7.18: Virtual Event Platform Architecture

### 7.11.2 Congress Administration

As a result of previous Congress planning experience, the Congress Chair opted from the beginning for a minimal size Organizing Committee. The people in the pictures below constituted the formal Congress Organizing Committee, though it should be acknowledged that several other people (mostly students) were involved in various parts of the planning process (including aspects such as social media, database checks and correction, etc.).

One of the first orders of business was to select a Professional Conference Organizer (PCO). A Request for Proposals was issued to both Canadian and American PCOs and meeting planners. We receive more than a dozen bids and selected Prestige Accommodations, Int'l., Inc., operating out of California, based on cost per value metrics and their extensive PCO experience and familiarity with HF/E, having organized the HF/ES annual meetings for over 30 years. Tragically, Steve Marlin, CEO of Prestige Accommodations, Int'l., Inc. passed away in early 2021. Steve provided outstanding support and wise counsel, always with a smile. He was sorely missed. We remain indebted to the Prestige

staff, whose expertise and outstanding professionalism guided us through the planning process. In particular, we are grateful to Laurie Ybarra, Sr. Meetings Manager, who oversaw the many diverse aspects of our ever-changing plans and Christine Reinhard, Director of Operations, who skillfully managed the budget, website and registration system.

The next milestone was to define the Congress theme, ***HF/E in the Connected World/L'ergonomie 4.0***, and design the Congress logo in time to launch the Congress promotional campaign at the 2018 Congress in Florence via an exhibit booth and presentations at the Closing Plenary. The logo depicts diverse human forms at the center of a connected world.

## IEA Organizing Committee

### IEA2021 Team

**Ian Noy**  
Congress Organizing Chair



**Nancy Black**  
Technical Program co-chair  
Université de Moncton



**Patrick Neumann**  
Technical Program co-chair  
Ryerson University



**Anne-Kristina Arnold**  
Technical Program -  
Posters  
Simon Fraser University



**Colleen Dewis**  
Platform Technical Liaison  
Dalhousie University



**Sadeem Qureshi**  
ECR Program Coordinator  
Ryerson University



**François Taillefer**  
French Language  
Université du Québec à Montréal



**Manobhram (Manu) Nellutla**  
Developing Countries  
Actsafes Safety Association



### PCO - Prestige Accommodation

**Laurie Ybarra**  
Sr. Meetings Manager  
**Christine Reinhard**  
Director of Operations

**Abigail Overduin**  
Exhibits  
The University of British Columbia



**Heather Kahle**  
Media Relations  
WorkSafeBC



**Jenny Colman**  
Media Relations  
WorkSafeBC



**Gina Vahlas**  
Events/Social  
WorkSafeBC



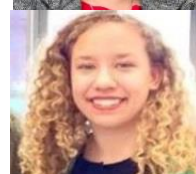
**Era Poddar**  
Events/Social  
Consultant



**Alison Heller-Ono**  
Events/Social  
CEO, Worksite International



**Hayley Crosby**  
Media Outreach  
Options Incorporated



**Jeanne Guerin**  
Canadian Academic Liaison  
Consultant



### **Congress Planning Timeline**

Gantt charts were created for the overall Congress as well as for Technical Program development. The Technical Program committee kept an Excel spreadsheet with milestone data that were reviewed and updated weekly.

### **Congress Budget**

The Congress Budget underwent several revisions as the delivery model changed from in-person to ultimately a fully virtual event. The budget goals changed over the course of time. The in-person budget was established with the purpose of setting fees in line with previous Congresses and result in a favorable financial outcome that would revitalize both IEA and ACE. The virtual budget aimed to deliver a solid and viable technical content at a price point that reflected the economic realities of the time. Both budgets were intentionally conservative, the main defining principle being to underestimate revenue and overestimate expenses.

It must be said that at the time of writing there continue to be uncertainties about final projections due to the fact that the IEA has no history of virtual event attendance and the adverse economic impact of the pandemic is unknown. A virtual Congress has definite advantages as well as disadvantages in relation to an in-person event. It is more accessible, especially to delegates from lesser developed countries or who are otherwise unable to attend in person. It also provides access to recorded sessions that can be viewed on-demand after the event. However, it does not support human interactions to the same extent or depth and it is far more prone to outside distractions.

Nonetheless, it appears that sufficient revenue has been received to date that there is little or no doubt as to the financial success of the Congress despite the rather low registration fees that have been instituted in an effort to facilitate attendance and promote accessibility.

### **Registration Fees**

There were three distinct models defined during the evolution of the Congress, necessitating formulating differing fees.

1. Initial Plan for the in-person Congress (Vancouver)
2. Introduction of the satellite virtual conference (Hybrid model)
3. Fully Virtual Congress
  - a. Despite pronouncements that in the event the Congress would go fully live, the registration fees would be increased, the decision was made at the time of pivoting to the full virtual Congress (February 8) that the virtual conference fees would not to be raised for delegates already registered or who would register within the next 10 days.
  - b. On February 19, new registration fees came into effect (widely publicized in advance)
  - c. As we began to experience unforeseen expenses, the announcement was made that late fees would be raised on May 10 and then again June 7
  - d. The registration fees for students and LMIC delegates were not raised at all until June 7

The announcement about going fully virtual was made February 8, 2021 and it was indicated that the Virtual Conference rates would apply for the full event for another 10 days, after which it would increase per the table below.

**Table 2: Summary Registration fees as a Function of Time and Congress model. The rates are expressed in Canadian currency (CA\$).**

Registration Fees (comparison over time)	In-person	Hybrid VC	Full Congress	After May 10	After June 7
		7/7/20 – 2/18/21	2/19/21 – 5/9/21	5/10/21 – 6/7/21	6/7/21 +
Full Congress, Member Advantage Rate	995	299	499	599	699
Full Congress, Member Regular Rate	1,250	299	499	599	699
One Day, Member	500				
One Day, Nonmember	600				
Full Congress, Nonmember Advantage Rate	1,250	495	595	695	795
Full Congress, Nonmember Regular Rate	1,495	495	595	695	795
IEA Council/ACE Council/2021 Committee	700				
Student Volunteer	-				
Full Congress, Student Member	300	125	125	125	125
Full Congress, Student Nonmember	350	125	125	125	125
One Day, Student	75				
Full Congress, Developing Countries (LMIC)	700	125	125	125	125

### 7.11.3 Technical Program

#### Development of Technical Program

The initial task of the Technical Program Committee (co-chaired by Nancy Black and Patrick Neumann) was to engage with the IEA TC Chairs and other individuals nominated by IEA-member societies to serve on the Scientific Committee. Over the span of 2 years, the Scientific Committee met via Zoom half a dozen times to communicate plans, define roles and responsibilities, obtain input, and establish and review action plans.

The majority of the TC Chairs were engaged and appreciated the fact that they were approached very early in the process. The next step was to select the Abstract Management software and after some comparative research it was decided to go with EasyChair. It seemed to have the capability to deal with the complexity of Tracks and concurrent sessions and it was compatible with what Springer would eventually require to publish the Congress Proceedings. EasyChair, as it turned out, had to be customized for the Congress and had a number of shortcomings that were not known until it came time to process the data or output files in a format that could be used to transfer data. Had we known early on how EasyChair would process the data inputted by authors we would have set it up differently. A problem with EasyChair is that the training they offer is superficial.

The overall development of the Technical Program was defined having the following phases and deadlines. Links to relevant instructions and templates were uploaded to the IEA2021 website.

MARCH 31, 2020: Call for Special Session Proposals

- Proposals for Special Sessions can include Symposia / Panels / Workshops & other content formats in 90-minute blocks
- Other formats do not need to fit into any of the existing IEA Technical Committee fields and can be associated with new or developing ergonomic fields.

JUNE 26, 2020: Deadline for Special Session Proposals

JULY 3, 2020: Feedback on Special Session Proposal acceptance / rejection, including comments.

JUNE 26, 2020: Call for Researcher or Practitioner Presentation (Oral / Poster) Proposals

- Each submission must be associated with ONE conference Track. Many of these relate to existing IEA Technical Committees; an "Other" Track is available for subjects which do not align with the specified Track topics.
- Students and early career researchers were asked to indicate this when submitting their abstracts so they can be considered for available prizes
- At this congress, lecture and poster presentations are of equal scientific importance. While authors may suggest their preferred format, the Technical Programming Committee will determine the format for each presentation.

SEPTEMBER 25, 2020: Deadline for Researcher or Practitioner Presentation (Oral / Poster) Proposals

DECEMBER 4, 2020: Feedback to authors of Researcher or Practitioner Presentation (Oral / Poster) Proposals including acceptance / rejection and suggestions for improvement.

FEBRUARY 5, 2021: Final Papers (Full length or Extended abstract) due from all authors

The next step was to define the Tracks and identify Track Managers. This was completed after the Call for Special Sessions when accepted symposia would augment the topic areas covered by the IEA TCs.

### **Calls for Special Sessions**

As defined above, the Call for Papers was accomplished in two separate phases. The first was a Call for proposals to organize special sessions. This Call was launched March 31, 2020, with a deadline of June 26, 2020. Special Sessions were defined as Panels, Workshops, alternate format sessions, and symposia (which are sessions on specified topics/themes defined by the organizer but to be created from the response to the general Call for Papers rather than a special session for which the organizer would propose the participants). The symposia that were to be formed from the submissions to the general call were defined as "open", while the ones where the organizer invited the participants were defined as "closed".

About 100 proposals for special sessions were received during the period. These were reviewed and the accepted proposals were used to refine the listing of Congress Technical Tracks.

## **Tracks**

Thirty-four Tracks, some corresponding to responsive Technical Committees; others defined by accepted special sessions. The Tracks are listed below, along with the respective Track Managers.

**Practitioner Cases (Ruud Pikaar)**

**Aerospace (Guy André Boy)**

**Activity Theories for Work Analysis and Design (Francisco Moura Duarte)**

**Affective Design (Rosemary Seva)**

**Aging and Work (Jodi Oakman)**

**Agriculture (Peter Lundqvist)**

**Anthropometry (Karen Bredenkamp)**

**Biomechanics (Rauf Iqbal)**

**Building and Construction (John Smallwood)**

**Ergonomics for Children and Educational Environments (\*Sarbjit Singh)**

**Ergonomics in Advanced Imaging (Jukka Hakkinen)**

**Ergonomics in Design for All (Isabella Tiziana Steffan)**

**Ergonomics in Manufacturing (Jim Potvin)**

**Ergonomics Work Analysis and Training (EWAT) (Catherine Delgoulet, Marta Santos)**

**Gender and Work (Marie Laberge)**

**Health and Safety (Gyula Szabó)**

**Healthcare Ergonomics (Marijke Melles)**

**HF in Supply Chain Design and Management (Fabio Sgarbossa)**

**HF/E Contribution to Cope with Covid-19 (Sara Albolino, Andrew Todd and Tommaso Bellandi)**

**HF/E Education and Professional Certification (Chien-Chi (Max) Chang, and Maggie Graf)**

**Human Factors and Sustainable Development (Andrew Thatcher)**

**Human Factors in Robotics (Sascha Wischniewski)**

**Human Modeling and Simulation (Gunther Paul)**

**IEA International Development (Andrew Todd)**

**Mining (Robin Burgess-Limerick)**

**Musculoskeletal Disorders (Ann Marie Dale)**

**Neuroergonomics (Nelson Ekechukwu)**

**Organizational Design and Management (ODAM) (Laerte Idal Sznelwar)**

**Slips Trips and Falls (Richard Bowman)**

**Systems HF/E (Paul Salmon)**

**Transport Ergonomics and Human Factors (TEHF) (Peter Burns)**

**Visual Ergonomics (Marino Menozzi)**

**Work with Computing Systems (WWCS) (Nicole Jochems)**

### **Call for Papers**

The Call for Papers was issued June 26 with a deadline of September 25, 2020.

Presentation modes included "Lecture" (15-minute slots) and "ePoster". The ePosters underwent a series of redefinitions and once the decision was made to go fully virtual, ePosters were set up to provide the authors the opportunity to upload a 350-GB video, as well as associated PDFs for papers or the poster. Lecture and ePoster presentation options were equally valued at this Congress.

The IEA and ACE were invited to submit non-scientific posters to showcase specific projects, TCs, etc. This was initiated to provide the IEA and ACE the opportunity to reach beyond the traditional community and describe current activities as well as invite people to join the effort.

### **Submissions by Country**

The chart below presents the number of submissions by country for the top 28 countries. The data are not entirely comprehensive in the sense that several submissions included co-authors from different countries. The country, therefore, is taken as the country of the presenter, or if none was indicated at the time of submission, the country of the first author.



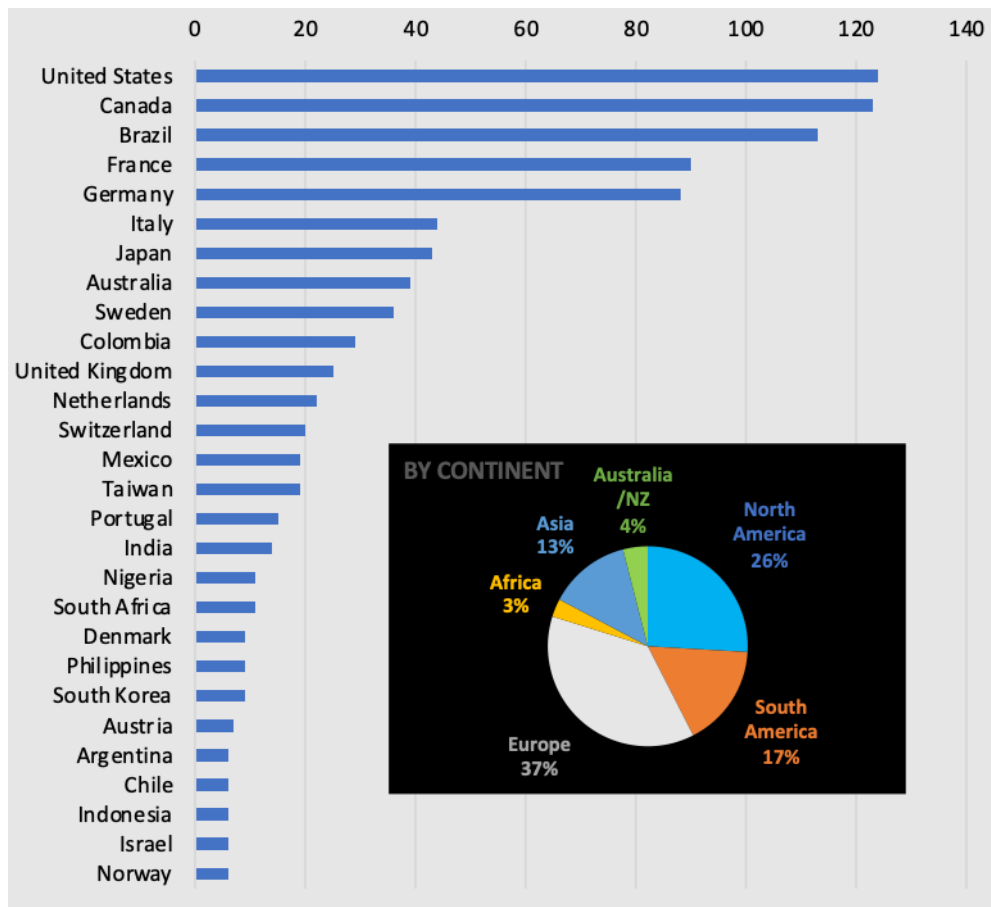
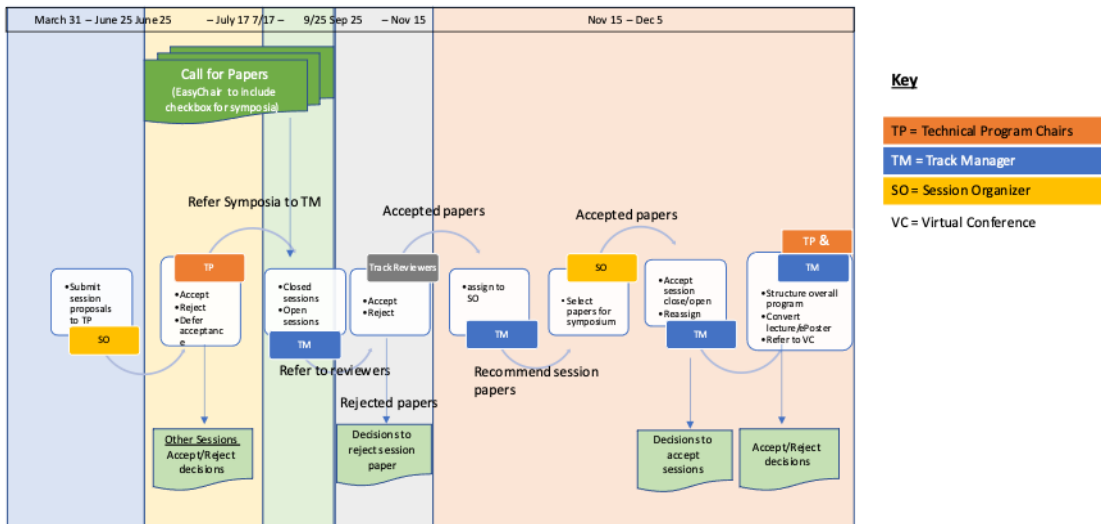


Figure 7.19. Submissions by Country

### Role of Track Managers

The proposals received were directed to the appropriate Track Manager who have established a pool of technical reviewers. This was a complex process given the mix of special sessions and paper submissions. It was made somewhat more complicated as the expectation was that organizers would manage their proposed sessions, but they would be rationalized with the Tracks as defined and would need to coordinate with the Track Managers. Residual submissions were to be reassigned, depending on content area. The following flowchart was created to help explain the process to the managers who were responsible for overseeing the “open” special symposia.

## 5 PROCESS FOR INCORPORATING SPECIAL SYMPOSIA



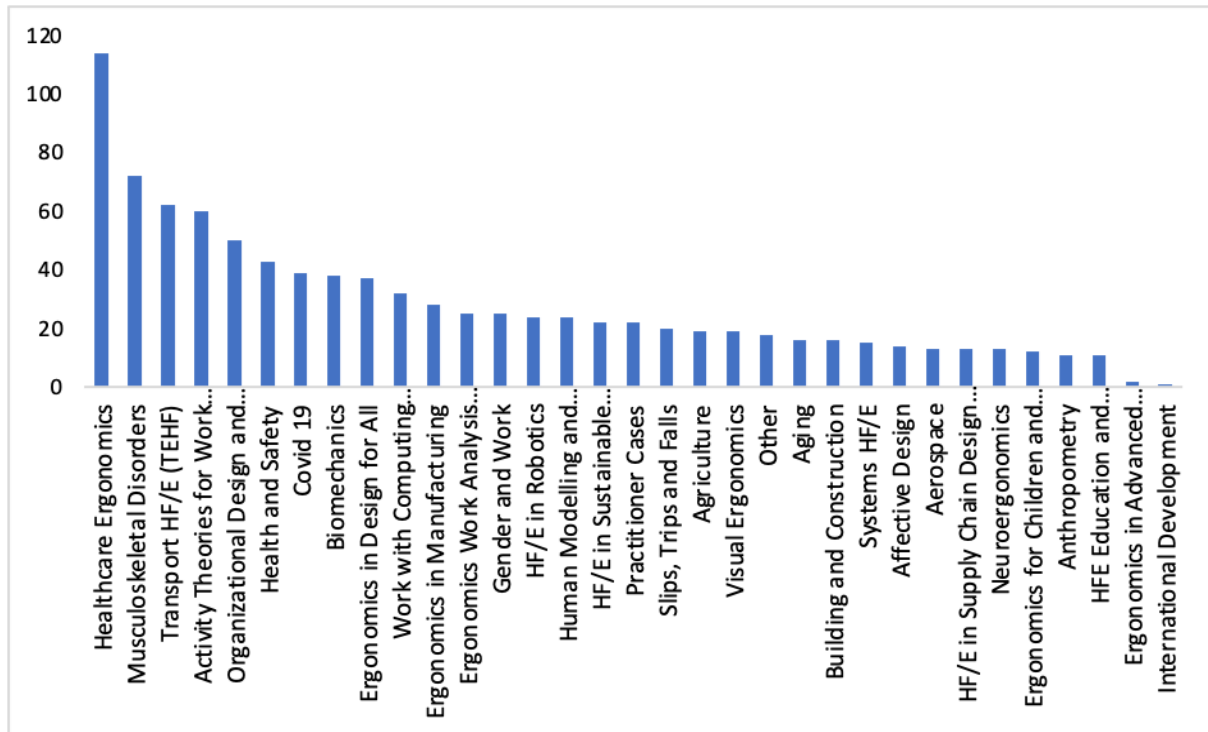
**Figure 7.20. Review Flow Chart for Symposia**

Essentially, the process entailed an initial review supervised by the Track Manager, who would decide to accept or reject the submission. Accepted submissions would be referred to the Symposium Organizer who would determine which should be included in their symposium. It was expected that the Track Manager and Symposium Organizer would confer. For example, if there are insufficient number of papers, the submissions would be returned to the general Track for re-allocation.

The Technical Committee Chairs would ensure that viable symposia would be appropriately located in room and time slot relative to other sessions during the Congress.

About 900 proposals were received in response to the General Call. The rejection rate after reviews and withdrawals was 10%.

The figure below indicates frequency of submissions per track.



**Figure 7.21. Submissions by Track**

### Program Overview

The review process resulted in the following structural elements.

- 705 papers presented with in a Symposium or a general program session
- 39 individual Symposia
- 93 posters
- 14 panels
- 11 workshops
- 6 ECR special sessions
- 7 Plenary sessions (opening, closing, Executive Panel and 10 keynote speakers)
- 98+ submissions were either rejected or withdrawn

The accepted papers and special sessions were organized in 206 technical sessions over 5 days.

### Keynote Speakers

Ten keynote speakers were invited, typically two on each of four days to share a 90-minute session. In two cases, the keynotes decided to do a joint presentation during the 45-minute window. This format offered an interesting alternative.

The following are the keynote speakers.

<p><b>Karen Messing</b>  Forgotten or ignored?  Why women (and others) may be left out of the 4.0 economy and what ergonomists can do about it</p>		<p><b>Rosemary Seva</b>  The Hidden Power of Affective Products and Environments</p>	
<p><b>Guy André Boy</b>  Human Systems Integration: The Right Mix of Technology, Organization and People</p>		<p><b>Ben Shneiderman &amp; Daniel Serfaty</b></p>	
<p><b>Fionnuala Rogerson</b>  An Architecture of Inclusion</p>		<p><b>Peter Hancock</b>  Trust in Automation and Autonomy</p>	
<p><b>Nidhi Gupta</b>  Measuring and analysing ergonomic demands: which direction to move?</p>		<p><b>Charles Vincent &amp; Mike English</b>  Managing risk in a Kenyan neonatal unit</p>	

**Proceedings and Journal Special Issues**

Authors of accepted papers were asked to submit either a chapter of at least 4 pages that would be published in the Congress Proceedings, or an extended abstract that would be made available to delegates via the Virtual Event Platform.

Springer agreed to publish the Congress Proceedings at no charge to IEA2021 and to allow registered delegates free eBook downloads for 4 weeks. The chapters submitted were organized in five volumes and submitted to Springer. Each volume contained the chapters associated with one or more tracks. Within Tracks, the chapters were arranged in order of the first author’s last name.

**Volume 1 SYSTEMS AND MACROERGONOMICS**

- Activity Theories for Work Analysis and Design
- Organizational Design and Management
- Ergonomics Work Analysis and Training
- Systems HF/E
- HF/E Education and Professional Certification

**Volume 2 INCLUSIVE DESIGN**

- Ergonomics in Design for All
- HF/E in Sustainable Development
- Gender and Work
- Slips, Trips and Falls
- Visual Ergonomics
- Ergonomics for Children and Educational Environments

- Aging

### **Volume 3 SECTOR-BASED ERGONOMICS**

- Transport HF/E (TEHF)
- Practitioner Cases
- Ergonomics in Manufacturing
- Agriculture
- HF/E in Supply Chain Design and Management
- Aerospace
- Building and Construction

### **Volume 4 HEALTHCARE AND HEALTHY WORK**

- Healthcare Ergonomics
- Health and Safety
- Musculoskeletal Disorders
- COVID-19

### **Volume 5 METHODS & APPROACHES**

- Work with Computing Systems (WWCS)
- Human Modelling and Simulation
- HF/E in Robotics
- Neuroergonomics
- Biomechanics
- Affective Design
- Anthropometry
- Ergonomics in Advanced Imaging

### **Promotions and Communications**

There are several channels used for promoting the Congress. Weekly or more frequent posts were published to announce planning progress, the Call for Papers, keynote speakers, exhibit and sponsorship opportunities, deadline reminders and website updates. The main media outlets included the following LinkedIn Groups.

	<b>International Ergonomics Association (IEA)</b> 10,832 members
	<b>IEA2021</b> Owner 531 members
	<b>Preventing Musculoskeletal Disorders (MSDs) in the workplace</b> 303 members
	<b>ITS - (Intelligent Transport Systems)</b> 32,368 members
	<b>HFCovid19</b> 333 members
	<b>Human Factors and Ergonomics Society (HFES)</b> 15,918 members
	<b>Certified Human Factors and Ergonomics Professionals</b> 1,164 members
	<b>Human Factors Interest Group (HFIG)</b> 161 members
	<b>Occupational Safety and Health Ergonomics Network (OSHEN)</b> 1,621 members
	<b>IEA2021Vancouver_SciCom</b> 77 members

Other channels include Facebook and Instagram pages. In addition, the IEA related stakeholders (Council representatives, networks, society leaders, collaborating organizations, etc.) through the monthly eblasts *IEA NewsBriefs*.

### **Sponsorships and Exhibits**

Sponsorship and Exhibit prospectuses were created and disseminated. They were further revised to reflect the changes made necessary by the introduction of the Hybrid and later the Full Virtual model. For example, we introduced virtual exhibit opportunities that were available through the Virtual Event Platform. In addition, there were revisions to the items available for sponsors and the schedules, etc. A total of CA\$ 114,000 in sponsorship revenues was raised through the campaign. The following sponsors were secured.



The following Exhibitors were registered at the time of writing.

- Posture 360
- Tech Ergo Appliquees
- Association of Canadian Ergonomists/L'Association canadienne d'ergonomie
- Ergonomics Society of Korea
- Ergotron
- ErgoCentric
- LifeBooster, inc.

### Update on Registered Delegates to Date

As at time of writing, a total of 1,038 delegates have registered for IEA2021. The type of registration is shown in the table below.

Complimentary Attendee	25
Member of an IEA Society	365
Non-member	244
OECD (Low & Middle Income) Countries	140
Student Member of an IEA Society	63
Student Non-member	201
	<hr/>
	1038

The primary employment sector of the 1038 delegates is listed in the table that follows:

Academia	510
Student	165
Consulting	119
Industry	83
Government/Military	80
Non-Profit	42
Healthcare	11
research	6
Retired	3
Hospital	2
Academic Research	1
contract research	1
Crown Corporation/Transportation and Delivery	1
Education	1
Health and Safety Organization	1
Heathcare	1
in transition	1
INDEPENDIENTE	1
Legal accident insurance for employees	1
Municipal Services	1
NA	1
National Accident Insurance	1
Public administration	1
Public employee	1
Salud	1
Technology	1
University	1
<b>Grand Total</b>	<b>1038</b>

Registrants learned about IEA in a variety of ways as seen in the table below

Colleague (word of mouth)	413	40
Attended previous IEA meetings	300	29
IEA Social media, online search, non-IEA newsletter	174	17
E-mail from an organization other than IEA	101	10
IEA Society/Association	31	3
University Association	9	1
Author	6	1

**Note about registration to date**

It is clear from the above that IEA member societies are not all actively promoting the Congress. Of course, the delegates who indicated they attended previous Congresses or heard from word of mouth may well have received information from an IEA society, so there exists some ambiguity in the numbers. Nevertheless, active promotion by IEA-member societies seems an area that warrants further investigation and improvement. The societies with greater than 4% of the delegates registered to date are ACE (23.4%), NES (6.1%), CIEHF (4.4%), GfA (4.2%), HF/ES (19.4%), HF/ESA (4.9%), HFNL (10.3%), and SELF (7.7%).



## 8. Recommendations for the future

Each section of this report offers and recommendations for future and suggestions for future activities within specific operational areas. The recommendations below are structured in terms of continuation of the 7 Strategic Policies – a key to our future sustainability and success.

### **1. Engage Stakeholders**

Communication with and engagement of our stakeholders must continue to be a priority. If our internal and external stakeholders are not engaged we cannot serve our mission and accomplish our goals. In particular we need to expand and strengthen the information flow from IEA to Member Society and Network leaders, and then on to Federated/Affiliated Society and Network members. Our communication methods work effectively only when our communications are passed forward from IEA representatives to their society members - and effective communication is essential to the integrity and functioning of our global association.

Engaging external stakeholders such as national and organizational leaders is also critical for increasing the influence and impact of HF/E on policies and regulations as well as system and product design. As Dul et al. (2012) suggested, this engagement will require education of and partnerships with system experts and powerful decision makers. Effective demonstration of the value of HF/E to these stakeholders remains a challenge for the future.

### **2. Collaborate with and reinforce networks**

Engagement and collaboration with IEA networks will continue to be important. Networks provide regional, philosophical, and language-based connections among our societies. It is important to continue the strategy of conducting P<sup>2</sup>DT workshops with networks to define regional priorities and projects. We can have the most impact by working with societies through their network leaders, and this will also increase solidarity among network members. Ultimately collaborations with networks will increase our ability to impact HF/E science and practice on a global level.

### **3. Contribute to science, technology, and practice**

The IEA Congress will continue to be a primary contribution to science, technology, and practice. IEA2021 has demonstrated that future hosts will need to implement a virtual element to the Triennial Congress. The IEA Webinar Series will continue to provide a significant virtual opportunity for disseminating our science, and we should encourage Technical Committees and other representative groups to take advantage of IEA webinar possibilities.

Technology is both a means and an end for IEA members. Current technology provides the capability for more inclusive meetings, seminars, and conferences. However, IEA researchers and practitioners must also be proactive with respect to new human-technology systems, as prescribed in Industry 5.0, to ensure their design is informed by the HF/E human-centered systems approach.

### **4. Identify the roles of IEA in promoting education, certification, and professional standards**

We hope that societies and universities will continue to contribute to the interactive map of educational HF/E programs around the world so that students, designers and other practitioners, researchers, and educators will be able to identify global resources. IEA has made significant progress on cementing the professional standards for HF/E practitioners in the Core Competencies and endorsement criteria for HF/E certification programs. Now is the time to turn our efforts toward educational programs, to identify existing levels and types of programs and associated coursework to prepare HF/E graduates for research and practice. Standardization of educational programs and cross-regional acceptance of certification status remain on the IEA agenda for future efforts.

### ***5. Strengthen relationships with external partners***

During this term IEA greatly strengthened our connections with external partners and these strong connections should be maintained in future terms. In particular, IEA collaborations with UN agencies such as ILO and WHO increase the impact of our global voice by inserting HF/E recommendations and requirements into UN agency action plans, recommendations, and ultimately regulatory documents. Our influence also increases when we collaborate with like-minded societies, such as ISQua, IISE, AES, INCOSE, ICOH, IOHA, FPE and others. These collaborations are particularly valuable to us as they promote the science and practice of HF/E within diverse domains - including health care, patient safety, systems engineering, or occupational health – that our discipline both draws from and contributes to.

### ***6. Reinforce the infrastructure of IEA***

IEA's infrastructure has traditionally been adaptable but sometimes tenuous. These are characteristics of an all-volunteer organization whose leaders change every three years and whose funding sources are sometimes unpredictable. We have taken many steps to standardize our practices, preserve our intellectual property, and reinforce our infrastructure but more can be done. It will be essential for IEA to focus effort on activities that both serve our members and contribute to our sustainability. For example, increased guidance and collaboration between IEA Congress host societies and the IEA Executive Committee as described in the Congress Model should encourage societies to host the Congress and should also result in positive outcomes for both IEA and the host society. Virtual Executive Committee meetings can reduce the need for some expenditures (although face-to-face meetings should not be abandoned as they are often more productive). Also, providing value to stakeholder organizations in return for sponsoring Executive Committee or Council meetings is a model that should be used more often in the future.

The responsibilities of the Executive Committee have increased as our activities and collaborations have become more complex. This opens opportunities for member involvement in defined roles as project leaders, liaisons to specific organizations, or delegates to particular regions as shown in the organizational chart in the President's Address (Section 1). The involvement of internal stakeholders from Federated Societies on EC activities will enhance and strengthen the ties between IEA and our member societies.

### ***7. Maintain a future focus for HF/E***

The world is changing at an increasingly fast pace, and IEA as well as human factors/ergonomics science and discipline must stay in advance of trends and needs to maintain relevance and importance. We can affirm that the future of HF/E is inextricably tied to other futures – the future of work, of health care, of design, of technology, of artificial intelligence, and of many other aspects of our future lives. IEA and our member societies must be proactive and adaptable and stand ready for game changing events – not only positive innovations but also unexpected negative events such as a global pandemic. A future focus requires that we embrace all aspects of human factors/ergonomics and continually refine our science and discipline. We must employ the HF/E integrative, systems approach as we meet new challenges. We have shown during the past year that we are capable of quick and creative responses to problems, innovative design solutions, and wide dissemination and promotion of information. These strengths must be honed as we look to the future and embrace it.

## 9. IEA Representation and Outreach to Members and External Stakeholders.

Location	IEA Representative(s)	Year	Month	Purpose
Helsingor, Denmark	Executive Committee	2018	August	2019 IEA Council meeting
				NES Conference
Washington DC, US	Michelle Robertson	2018	September	Presentation to International Occupational Hygiene Association (IOHA) at Annual Meeting
Santiago, Chile	Jose Orlando Gomes	2018	October	XI Sochergo Congress
Philadelphia, PA, US	Kathleen Mosier	2018	October	HFES Annual Meeting
Havana, Cuba	Kathleen Mosier, Jose Orlando Gomes, Yushi Fujita	2018	November	Meetings with Cuban officials and University Representatives on HF/E programs and practices in Cuba
				19 Convencion Cientifica de Ingenieria y Arquitectura
				Meetings with Cuban officials and University Representatives on HF/E programs and practices in Cuba
Bangkok	Yushi Fujita	2018	December	ACED Council Meeting
Colombia	Executive Committee	2019	March	EC meeting
				URA presentations in Bogota, Cali, Medellin, and Barranquilla
Hsinchu/Taiwan	Yushi Fujita	2019	March	HFE Education Ad Hoc Committee
Geneva, Switzerland	Michelle Robertson	2019	April	72 <sup>nd</sup> World Health Assembly WHO meeting, collaboration with International Commission on Occupational Health (ICOH) and the International Occupational Hygiene Association (IOHA), delivered joint statement supporting the need for Universal Occupational Health Coverage including providing specialized or basic occupational health and HF/E services on the Assembly Floor.

Stratford-upon-Avon, UK	Kathleen Mosier, Juan Carlos Hiba	2019	May	Presentation at CIEHF Meeting "Future of work and future of HFE - Views and perspectives from the UK"
Stratford-upon-Avon, UK	Kathleen Mosier, Michelle Robertson, Yushi Fujita, Juan Carlos Hiba	2019	May	ILO-IEA Joint Project Meeting
Helsingor, Denmark	Executive Committee	2019	August	2019 IEA Council meeting
				NES Conference
Santiago de Chile, Chile	JC Hiba	2019	August	Personal meetings with Mauricio Santos, President of SOCHERGO and Miguel Acevedo, past-president, for discussing issues related to founding an HFE Observatory in SOCHERGO.
Xian, China	José Orlando Gomes	2019	August	2019 Chinese Ergonomics Conference - CES
City of Guatemala, Guatemala	JC Hiba	2019	October	Personal visit to University San Carlos. Provision of technical advisory services on founding an HFE Unit. Prof. Nora L. García Tobar, Chair Research Unit, Industrial Mechanics School. Faculty of Engineering.
Buenos Aires, Argentina	Andrew Todd	2019	November	VI Ulaergo Congress
Enugu, Nigeria	Andrew Todd	2019	November	IEA P2DT workshop IEA HF/E Development workshop ESN congress
Buenos Aires, Argentina	Andrew Todd, Juan Carlos Hiba	2019	November	IEA/ULAERGO P2DT workshop ULAERGO congress attendance
Buenos Aires, Argentina	Juan Carlos Hiba	2019	November	Live Tripartite Forum: "Ergonomía al alcance de todos en el siglo XXI". VI Latin American Ergonomics Congress.

Buenos Aires, Argentina	JC Hiba & A. Todd, IEA International Development Committee.	2019	June	Live Workshop “How to encourage the development of research and practical applications of high quality HF/E in Latin America”. VI Latin American Ergonomics Congress.
Jalandhar, India	José Orlando Gomes	2019	November	HWWE2019 Congress of ISE
Seattle, WA, US	Kathleen Mosier, Michelle Robertson, Yushi Fujita	2019	November	ILO-IEA Joint Project Meeting
Florence, Italy	Andrew Todd	2019	December	Second Expert Meeting for the collaborative design of the Global Knowledge Sharing Platform for Patient Safety (GKPS)
Geneva, Switzerland	Kathleen Mosier	2020	February	WHO Global Patient Safety Summit
				Meeting with ILO – Collaboration on IEA/ILO Guidelines for HF/E in Work System Design
Remote	Executive Committee	2020	April	Executive Committee Meeting
Remote	Kathleen Mosier; Michelle Robertson	2020	April	Presentations at CIEHF Conference
Geneva, Switzerland (virtual)	Michelle Robertson	2020	April	ILO World Safety Day webinar
Geneva, Switzerland	Michelle Robertson	2020	April	73 <sup>rd</sup> World Health Assembly WHO: An ICOH/IEA joint statement was posted stating that the COVID-19 pandemic once again demonstrated the need for and value of occupational health and human factors/ergonomics services and the high sense of urgency to protect the health workers against COVID-19 to safely serve the victims of COVID-19
Remote	Andrew Todd	2020	June	Colombian Ph.D. program development
Remote	Andrew Todd	2020	July	First Annual ESN Southeast Regional Conference

Rosario, Argentina	JC Hiba	2020	September	Proposal for founding an HFE Observatory at University of Rosario.
Remote	Andrew Todd	2020	October	ACED Meeting - Promotion of International development and P2DT
Remote	José Orlando Gomes	2020	November	XX Brazilian Ergonomics Congress (ABERGO)
Remote	José Orlando Gomes, Kathleen Mosier	2020	November	1 <sup>st</sup> . Mercosur Ergonomics Congress, organized by Argentinian Ergonomics Association (ADEA)
Remote	José Orlando Gomes	2020	December	International Ergonomics Conference, Ergonomics 2020, Croatia
Remote	José Orlando Gomes	2020	December	ACED/SEANES 2020, The Philippines
Remote	José Orlando Gomes	2020	December	HWWE2020, India
Remote	José Orlando Gomes	2020	December	~ 8 <sup>th</sup> . International Ergonomics Conference, Ergonomics 2020, Croatia
Remote	José Orlando Gomes	2020	December	ACED/SEANES 2020, The Philippines
Remote	José Orlando Gomes	2020	December	~HWWE2020, India
Remote	José Orlando Gomes	2020	December	Foundation of Portuguese Speaking-Countries Community on HFE (Angola, Brazil, Guinea-Bissau, Portugal, and Mozambique) with support of ABERGO and APERGO.
India (Virtual)	Kathleen Mosier	2020	December	Presentation to Indian Ergonomics Society Conference (HWWE)

Remote	Thomas Alexander	2020	December	Expert group on European Research Program
Remote	Kathleen Mosier, Thomas Alexander, Sara Albolino, Andrew Todd	2020	February, April, August, October	Member of advisory board of beyondwork2020, European Conference on Labour research
				Session "Ergonomics and Human Factors in Today's and Future's Labour – a Global Perspective"
Kaiserslautern, Germany	KJ Zink & JC Hiba	2020-2021	December to May	Virtual informal agreement with Dr. Harald Weber, Director of Institut für Technologie und Arbeit (ITA), (Institute for Technology and Work) for institutional support to questionnaire analysis of the survey "Main world of work trends and HFE initiatives related to the future of work in IEA's Networks and Societies".
Remote	Andrew Todd & Jose Orlando Gomes	2021	January	IEA meeting with the recent founded Bangladesh Ergonomics Society with help of India Ergonomics Society
Geneva, Switzerland (virtual)	Michelle Robertson	2021	January	WHO Executive Board (EB) 148 meeting delivered statement on the EB floor regarding the critical importance of patient safety and recognizing that HF/E has a central role in the design of safe patient safety systems and advocating for patient safety.
Remote	Michelle Robertson	2021	January	INCOSE HSI workshop
Iran (Virtual)	Kathleen Mosier	2021	February	Presentation to Iranian Ergonomics Society Conference

Remote	Andrew Todd, Jose Orlando Gomes	2021	February	Meeting with Ecuadorian Ergonomics Society to promote P2DT
Virtual contacts with around 10 IEA federated societies (Spain, Brazil, Croatia, etc.)	JC Hiba & KJ Zink	2021	February to 30 April	Mails to their Directives for asking their cooperation for filling up the questionnaire of the above mentioned survey.



## 10. Appendices

### 10.1. IEA Executive Committee

#### **OFFICERS**

##### **President**

Kathleen Mosier, Ph.D.

USA

Email: [President@iea.cc](mailto:President@iea.cc)

##### **Vice President and Secretary General**

Sara Albolino, Ph.D.

Italy

Email: [VPSG@iea.cc](mailto:VPSG@iea.cc)

##### **Vice President and Treasurer**

Jose Orlando Gomes, PhD., CPE

Brazil

[VPTreas@iea.cc](mailto:VPTreas@iea.cc)

#### **STANDING COMMITTEE CHAIRS**

##### **Communications and Public Relations**

Michelle Robertson, Ph.D., CPE

USA

Email: [cpr@iea.cc](mailto:cpr@iea.cc)

##### **International Development**

Andrew Todd, PhD.

South Africa

Email: [IDChair@iea.cc](mailto:IDChair@iea.cc)

##### **Professional Standards and Education**

Chien-Chi (Max) Chang, PhD

Taiwan

E-mail: [PSEchair@iea.cc](mailto:PSEchair@iea.cc)

##### **Science, Technology and Practice**

Dr. Thomas Alexander

Germany

Email: [STPChair@iea.cc](mailto:STPChair@iea.cc)

##### **Development and Promotion**

Elina Parviainen

Finland

Email: [DPChair@iea.cc](mailto:DPChair@iea.cc)

## **NON-VOTING MEMBERS OF THE IEA EXECUTIVE COMMITTEE**

### **Past President, Awards Chair**

Yushi Fujita, PhD, CPE, CPE-J  
Japan  
Email: [PastPres@iea.cc](mailto:PastPres@iea.cc)

### **IEA2021 Congress Chair**

Y. Ian Noy, Ph.D.  
Canada  
Email: [IEA2021chair@gmail.com](mailto:IEA2021chair@gmail.com)  
Website: <https://www.IEA2021.org>

### **Director**

Switzerland  
Dr. Margaret Graf, Eur.Erg.  
[dir@iea.cc](mailto:dir@iea.cc)

## **11.2. Past Officers**

1961-1964:	President Secretary-Treasurer	S. Forssman E. Grandjean
1964-1967:	President Secretary-Treasurer	G. Lehman E. Grandjean
1967-1970:	President Secretary-Treasurer	P. Ruffell-Smith E. Grandjean
1970-1973:	President Secretary General Treasurer	B. Metz F. Bonjer J. de Jong
1973-1976:	President Secretary General Treasurer	F. Bonjer R. Sell J. de Jong
1976-1979:	President Secretary General Treasurer	A. Chapanis R. Sell H. Scholz
1979-1982:	President Secretary General Treasurer	J. Rosner H. Davis H. Scholz

1982-1985:	President Secretary General Treasurer	S. Sugiyama H. Davis J. Rutenfranz/B. Shackel
1985-1988:	President Secretary General Treasurer	H. Davis I. Kuorinka B. Shackel
1988-1991:	President Secretary General Treasurer	I. Kuorinka H. Hendrick B. Shackel
1991-1994:	President Secretary General Treasurer	H. Hendrick P. Rookmaaker I. Noy
1994-1997:	President Secretary General Treasurer	M. Helander P. Rookmaaker I. Noy
1997-2000:	President Secretary General Treasurer	I. Noy W. Karwowski K. Kogi
2000-2003:	President Secretary General Treasurer	W. Karwowski P. Falzon K. Kogi
2003-2006:	President Secretary General Treasurer	P. Falzon S. Bagnara K. Laughery
2006-2009:	President Secretary General Treasurer	D. Caple P. Carayon M. Chung
2009-2012	President VP Secretary General VP Treasurer	A. Imada E. Wang K. Zink
2012-2015	President VP Secretary General VP Treasurer	E. Wang M. Fraser Y. Fujita
2015-2018	President VP Secretary General VP Treasurer	Y. Fujita K. Mosier J.O. Gomes
2018-2021	President VP Secretary General VP Treasurer	K. Mosier S. Albolino J. O. Gomes

### **11.3. Past IEA Triennial Congresses**

1961	Stockholm, Sweden
1964	Dortmund, Germany
1967	Birmingham, United Kingdom
1970	Strasbourg, France
1973	Amsterdam, The Netherlands
1976	College Park, Maryland, USA
1979	Warsaw, Poland
1982	Tokyo, Japan
1985	Bournemouth, United Kingdom
1988	Sydney, Australia
1991	Paris, France
1994	Toronto, Canada
1997	Tampere, Finland
2000	San Diego, California, USA
2003	Seoul, Republic of Korea
2006	Maastricht, Netherlands
2009	Beijing, China
2012	Recife, Brazil
2015	Melbourne, Australia
2018	Florence, Italy
2021	Held virtually; hosted by Canada

### **11.4. Past Meetings of IEA Council**

1964	Dortmund, Germany
1965	Paris, France
1967	Birmingham, United Kingdom
1967	Brighton, United Kingdom
1969	Noordwijk, The Netherlands
1970	Strasbourg, France
1971	Brussels, Belgium
1972	Schipol, The Netherlands
1973	Amsterdam, The Netherlands
1974	Amsterdam, The Netherlands
1975	Dortmund, Germany
1976	College Park, Maryland, USA
1977	Hayes, USA
1978	Luxembourg and Munich, Germany
1979	Warsaw, Poland
1980	Bournemouth, United Kingdom
1981	Rochester, New York, USA
1982	Tokyo, Japan
1983	Turin, Italy
1984	Toronto, Canada
1985	Bournemouth, United Kingdom
1986	Vancouver, Canada
1987	Stuttgart, Germany
1988	Sydney, Australia
1989	Noordwijk, The Netherlands
1990	Kyoto, Japan

- 1991 Paris, France
- 1992 Berlin, Germany
- 1993 Warsaw, Poland
- 1994 Toronto, Canada
- 1995 Rio de Janeiro, Brazil
- 1996 Breckenridge, Colorado, USA
- 1997 Tampere, Finland
- 1998 Cape Town, South Africa
- 1999 Santorini, Greece
- 2000 San Diego, California, USA
- 2001 Florence, Italy
- 2002 Santiago, Chile
- 2003 Seoul, Republic of Korea
- 2005 Funchal, Madeira
- 2005 San Diego, California, USA
- 2006 Maastricht, Netherlands
- 2007 Boston, Massachusetts, USA
- 2008 Reykjavik, Iceland
- 2009 Beijing, China
- 2010 Brugge, Belgium
- 2011 Grahamstown, South Africa
- 2012 Recife, Brazil
- 2013 Paris, France
- 2014 Taipei, Taiwan
- 2015 Melbourne, Australia
- 2016 Medellín, Colombia
- 2017 Singapore
- 2018 Florence, Italy
- 2019 Helsingør, Denmark
- 2020 Held virtually
- 2021 Held virtually



**IEA Council at 2019 Council Meeting in Helsingør, Denmark**