SMB/5868/R

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**2016-05-03**

**INTERNATIONAL ELECTROTECHNICAL COMMISSION**

**STANDARDIZATION MANAGEMENT BOARD**

**SUBJECT** **SMB meeting 156, agenda item 9.2, Geneva**

Report of ACART, *Advisory Committee on Applications of Robotic Technologies,* following its meeting on March 10/11 in Worcester, MA, USA

## BACKGROUND

ACART held its first meeting on 2016-03-10/11. The meeting was held at the IEC Regional Center for North America in Worcester, MA USA. The next ACART meeting is scheduled on 15/17 June in Shenyang, China.

The following report summarizes the main achievements and ACART decisions of the meeting which was attended by 7 members and 3 guests. Apologies were received from 3 members. The attendance list is given in Annex A.

The report is in two parts:

**Part A** – Recommendations submitted to the SMB for formal approval: **None**.

**Part B** – Other items of interest
SMB Member's attention is drawn to the information given under item(s) B1 to B5.

**Annex A** – List of ACART attendees in Worcester
**Annex B** – List of presentations made at the ACART meeting in Worcester

## ACTION

SMB members are **invited to submit any comments** on Part B of the report, using the IEC Technical Server, **before 2016-06-03**.

**PART A: recommendations for approval**

None.

**PART B: other items of interest**

### B.1 Activities regarding Robot Technologies

Each NC represented made a presentation outlining their activities regarding robot technologies in their respective countries. The presentations can be found on collaboration tools. (See Annex B).
Note: The presentation from Sweden was verbal, no hard copy was available

Each TC represented made a presentation regarding Robotic Technology in their TC.
The presentations can be found on collaboration tools. (See Annex B).
Note: The presentation from TC61 was verbal, no hard copy was available

### B.2 Determination of ACART Chair

As per the agenda, motivation statements were submitted by those wishing to be considered for the position of Chair prior to the meeting. Motivation statements were received from Prof. Haibin Yu and Mr. Sungsoo Rhim.
Subsequent to the presentation of both motivation statements (Mr. Redgate provided the motivation statement for Mr. Sungsoo Rhim) and the NC and TC member presentations a secret ballot was taken on the second day of the meeting to determine the Chair for ACART

**Results of the ballot**: Prof. Haibin Yu was voted Chair of ACART

### B.3 Determination of Future Work

The members reviewed and discussed at length many of the recommendations in the final SG 7 report.
The definition of "Robotic Technology" as outlined in the SG 7 report (see below) was discussed and it agreed that this definition should be reviewed and possibly revised.

**Definition as it appears in the final SG 7 report:**
Robotic technology is the combination and application of following techniques to simulate, replace or assist human (also animal) function or interaction in performing one or more tasks:
Information and communication technology (data processing, running a logic)

- Autonomy
- Mobility/manipulation
- Combining sensor and controlled actuator technology

**Proposed Revised Definition:**
"Technology utilized in a device which supports a degree of autonomy of a system"
Several variations of the definition are still under consideration and the determination of a final definition will be on the agenda for the next ACART meeting.

### B.4 Level by Level Framework

Professor Yu presented slides illustrating levels and a framework of each type of Robot. The presentation was informative and appears to provide a pathway for developing a comprehensive matrix. However the presentation was in Chinese and will need to be translated.

**Action Item: Mr. Liu, the assistant of Prof Yu, agreed to translate the framework into English**

### B.5 Proposed ACART development plan

To achieve the goal of IEC ACART in the next 18 months, the following three-step plan is proposed:

**Step 1**
A level by level framework breakdown of each type of robot will be developed. This framework will be used as a matrix to generate boundaries between IEC and ISO technical committees. As each TC of IEC or ISO has its own applicable category of robotics, we will ask the respective TCs to identify which category they have an interest in. For example, IEC TC 59/SC 59F/WG5 is interested in cleaning robots, ISO/TC 299 JWG5 is interested in medical robot safety. They will label their interested category of robotics in the framework. In this way, a clear borderline will be generated among the different TCs. The goal of ACART is that the TCs of IEC and ISO carry on their work based on the labeled matrix to prevent future conflict or overlaps. If several TCs are interested in the same robotic category (for example, vocabulary and symbols), it will be identified as an overlap. The first step will be finished by the end of 2016.

**Step 2**
Overlaps and conflicts will be resolved in a feasible way. If the overlap is between IEC TCs, ACART will coordinate with TC Chairs, if necessary with assistance from the IEC SMB.
If the overlap is between IEC and ISO, ACART will recommend that the ISO also create a mirror Advisory Group with the long term goal of creating a Joint Advisory Group. The overlaps will be discussed and solved through the joint advisory group. The second step will be finished by the end of March of 2017.

**Step3**
A guideline will be prepared that outlines the critical aspects of preparing a standard for products that incorporate robotic technology. ACART recognizes that is a complex task. Robotics is very multi- and inter-disciplinary; involving electromechanical technology, control and automation, information and communication technology, as well as mobility and navigation. Due to the fact that there are many standardization organizations related to robotic technology, the guideline will be prepared in as transparent a way as possible, involving different standardization organizations and experts from different technical fields. The goal of ACART is to complete the guideline by the end of 2017.

**ANNEX A – List of ACART attendees in Worcester**

**Present**:

**Members**:

| | |
|---|---|
| Mr. Tetsuo Kotoku | Japan |
| Mr. Burkhard Zimmermann | Switzerland |
| Mr. Seungbin Moon | Korea |
| Mr. Thomas Pilz | Germany |
| Mr. Daniel Posner | USA |
| Mr. Karl-Erik Westman | Sweden |
| Mr. Haibin Yu | China |

**Central Office:**

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|---|---|
| Mr. Andrew Redgate | Acting ACART Secretary |

**Guests**:

| | |
|---|---|
| Mr. Wu Meng | China (Representing Mr. Dejun Ma, TC61) |
| Mr.Singh Amitesh | USA (Representing TC 65, not yet approved by the SMB) |
| Mr. Lianquing Liu | China (Assistant to Mr. Haibin Yu) |

**Apologies:**

| | |
|---|---|
| Mr. Dejan Ma | China |
| Mr. Paolo Ravazzani | Italy |
| Mr. Sungsoo Rhim | Korea |

## ANNEX B

## List of presentations made at the ACART meeting in Worcester

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|---|---|
| **ACART/01/Pres** | **China** |
| **ACART/02/Pres** | **Japan** |
| **ACART/03/Pres** | **Korea** |
| **ACART/04/Pres** | **USA** |
| **ACART/05-06/Pres** | **TC59** |
| **ACART/07/Pres** | **TC62** |
| **ACART/08/Pres** | **ISO** |