ASET-EU Air System Engineering and Technology Conference - Europe

5 November 2019



Coordination and Alignment of IEC & ISO Standards for Energy Efficient Electric Motor Driven Systems (CAISEMS)

INTRODUCTION

AMCA ASET-EU

5 November 2019, Brussels, Belgium

Maarten van Werkhoven, IEC ACEE TG6 Conrad. U. Brunner, IEC ACEE, Convenor TG6

Global Electricity Consumption



Global end-use electricity: IEA WEO 2016

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Electric Motor Driven Systems (EMDS)



Source: ACEE Case Study 2, Motors, 2018

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9 Technical Committees





Preparation of energy efficiency publications and the use of basic energy efficiency publications and group energy efficiency publications

Policy Guidelines for Motor Driven Units

Part 2: Recommendations for aligning standards and regulations for pumps, fans and compressors

May 2018

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IEC Advisory Committee for Energy Efficiency, TG6 Initiator CAISEMS project

Background:

- Electric motors driven systems are responsible
 for 53% of global electricity use (Re: IEA WEO 2016)
- Motor systems can harvest the most energy savings
- Motor systems need System Standards
- Initiative of IEC ACEE TG6:
 - IEC Guides 118 and 119 (published March 2017)
 - Background research by EMSA: Policy Guidelines for Motor Driven Units (part 1: October 2016 /part 2: May 2018)
 - Cooperation with several IEC and ISO secretariats in Geneva and Singapore and all TCs involved
- Members of IEC ACEE Task Group 6:
 - Conrad U. Brunner, Convenor, Switzerland (IEC TC2, IEC ACEE)
 - Kirk Andersen, NEMA, USA (IEC ACEE)
 - Franco Bua, CEI, Italy (IEC ACEE)
 - Benno Weis, Siemens, Germany (IEC TC22, IEC ACEE)
 - Maarten van Werkhoven, EMSA, Netherlands (IEC ACEE)

-> 1st Meeting of CAISEMS 20 September 2019, Tokyo Japan



Goals of the CAISEMS project

1. Aligned terminology, scope and boundary for EMDS

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- 2. Coordinated operating points and conditions for tests
- 3. Typical operating characteristics and time/load profiles for economy
- 4. Ex ante: calculation method for system energy performance
- 5. Ex post: acceptance / testing procedure for system energy performance
- 6. Coordinated efficiency classification methods and metrics for product and system energy performance
- 7. Aligned interpolation method for losses and efficiency of EMDS

Goals of the workshop

- 1. Explain current situation of IEC and ISO Standards for Energy Efficiency in EMDS
- 2. Learn from all TC's involved: status and projects in EE
- 3. Show potential fields for coordination and alignment
- 4. Identify energy efficiency aspects

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- 5. Discuss necessity for Group and Basic standards
- 6. Identify key stake-holders for improvement
- 7. Form joint Task Force for further action

Conversion steps: Complexity of EMDS (full and partial load)

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SYSTEM EFFICIENCY $[\eta] = OUTPUT / INPUT$

Cooperation between TCs

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Participants

28 Participants:

- 13 Invited Guests
- 15 Speakers

IEC TC (3):

- 2 Motors
- 22 Converters
- 121 Switchgear and Controlgear

ISO TCs (3):

- 115 Pumps
- 117 Fans
- 118 Compressors for Air

University/Research (4):

- DTI (Denmark)
- EMSA (AU, AT, CH, DK, NL, SW, US) Gent (Belgium)
- KIT (Germany)
- TPA (Netherlands)

Countries (11):

- Belgium
- Denmark
- France
- Germany
- Hungary
- Italy
- Japan
- Netherlands
- Switzerland
- UK
- USA

Regulators (3):

- EU (DG Energy)¹
- Japan (METI)²
- Switzerland (SFOE)³

1. EU Directorate-General for Energy

- 2. Japan Ministry of Economy, Trade and Industry
- 3. Swiss Federal Office of Energy

Industry (10):

- Atlas Copco
- Danfoss
- ebmpapst
- Fuji
- Greenheck Fan
- Hitachi
- KSB
- Schneider Electric
- Siemens
- Wilo

Industry Associations (9):

- AMCA (US/EU)
- CEMEP (Europe)
- Europump (EU)
- EVIA (EU)
- JEMA (Japan)
- JISC (Japan)
- JSA (Japan)
- NEMA (USA)
- Pneurop (EU)

IEC & ISO TC members

System Engineering and Technology Conference





SC22G, Converters

TC121, Switch-/Controlgear

Benoit Leprétire IEC TC 121 France

TC115, Pumps

Markan Tanpa

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Results of workshop

- 1. The workshop was a success to bring together for the first time the key stakeholders for EMDS from IEC and ISO, from Industry, Universities and Government Regulators.
- 2. Good representation of IEC and ISO TCs, industry and associations plus regulators.
- 3. Regulators expressed interest in coordinated system standards by IEC and ISO.
- 4. Energy efficiency is important for Electric Motor Driven Systems.
- 5. Systems are important because they harvest the biggest energy savings.

Results of workshop

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- 1. Constructive discussion on how to conceive system standards.
- 2. The participants provided a number of proposals on organizational and technical level on how to improve the cooperation between the TCs involved and to coordinate and align the respective standards.
- 3. The intensive collaboration is needed: stakeholders are willing to collaborate, analyze the problems because it is important; they want to identify the problems, define the goals and the necessary tools.
- 4. Consensus on next steps
- Many spontaneous participants to join future work in CAISEMS. (deadline by 30 November 2019 to announce interest for collaboration)

NEXT STEPS

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1.	Form a CAISEMS Task Force jointly with IEC & ISO, hosted by ACEE TG6, invitation for volunteers from each TC	30 November 2019
2.	 Updates: lists of relevant topics to be clarified and coordinated Standards (and drafts) for EE in EMDS in IEC & ISO Terminology questions to be clarified - EE classification metrics - hoven Interpolation methods - MEPS existing and drafts for EMDS and components - 	31 December 2019
3.	Set up goal and workplan 2020, 2021	31 March 2020
4.	 2nd MEETING of CAISEMS: video conference ▶ Set up a Working Group 	31 May 2020
5.	 3rd MEETING of CAISEMS: Zurich (Motor Summit) ► Identify Horizontal Energy Efficiency Aspects ► Workplan with Tasks 	20 November 2020

EMSA Electric Motor Systems Annex





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Goal: help governments design & implement successful Energy Efficiency policies



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Thank you

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