



**EPSMA TC1 2017  
Technical Committee Meeting  
15<sup>th</sup> May 2017**

**Held at Siemens AG, Gleiwitzer Str. 555, 90475 Nürnberg.**

## EPSMA Technical Committee Meeting 15<sup>th</sup> May 2017

Date: Monday, 15<sup>th</sup> May 2017  
 Time: Arrive from 11:30 for meeting 12:00 ~ 17:00.  
 Venue: Siemens AG, Gleiwitzer Str. 555, 90475 Nürnberg. [http://web2.cylex.de/anfahrt/siemens-ag-a\\_d-pt-5-2603756-anfahrt.html](http://web2.cylex.de/anfahrt/siemens-ag-a_d-pt-5-2603756-anfahrt.html)  
 Please report to the security reception on your arrival.  
 Tel: Paul Conway: +44 7814183450 (mobile), Mrs. Annette Strobel, Siemens: Tel: +49 911 895-4067 (Internal: 40 67)

### Siemens AG, Meeting Room: "Ernst Plank" in house no. 2, 2B8.1.

11:30	<b>Arrival for light buffet lunch at Siemens AG.</b>	All
12:00	<b>Open meeting, introductions and brief review of agenda</b>	Paul
12:20 - 12:40	<b>Safety of Low-Voltage Switch Mode Power Supplies'</b> (The new standard IEC 61204-7, 2nd edition: proposed in 22E/142/NP). <ul style="list-style-type: none"> <li>• The status of the IEC 61204-7, 2<sup>nd</sup> edition which takes account of IEC62477-1.</li> <li>• Questions.</li> </ul>	Holger Laible, Chairman of IEC SC 22E. All
12:40 – 13:00	<b>UL508 and UL-61010</b> <ul style="list-style-type: none"> <li>• Review of EPSMA concerns and comments.</li> <li>• Follow-up.</li> </ul>	Michael All
13:00 - 13:20	<b>General TC status review</b> <ul style="list-style-type: none"> <li>• Update on current and possible future TC member's status.</li> <li>• Brief review of projects and actions</li> <li>• Approval of TC2-16 minutes</li> </ul>	Paul Paul TC2-16 Attendees
13:20- 13:40	<b>EPSMA Guideline</b> <b>'Harmonic Current Emissions Guidelines to the standard EN 61000-3-2</b> <ul style="list-style-type: none"> <li>• Progress on update from EN 61000-3-2:2006 to IEC 61000-3-2:2014</li> </ul>	Milos, Dave
13:40- 14:10	<b>Semiconductor Presentation – Infineon</b> <b>EV Charging Station Applications (part of the HP SMPS)</b>	Francesco
14:10- 14:20	<b>Refreshment break</b>	All
14:20- 15:20	<b>EPSMA Guideline 'CE MARKING GUIDANCE FOR POWER SUPPLIES'</b> <ul style="list-style-type: none"> <li>• Review update to meet 2014 directives mandatory in April 2016.</li> </ul>	Dominique, Bernhard, Christian, Others?
15:20 - 15:40	<b>Accurate Efficiency Measurements</b> <ul style="list-style-type: none"> <li>• Progress to add 3-phase AC-DC power conversion, measuring methods for DC-AC conversion and AC-AC conversion and a section on Power Sources.</li> <li>• Investigation progress with 3-Phase measuring techniques for DC-AC and AC-DC, and the Power Circulation Efficiency Measurement method.</li> </ul>	Hubert, Vlad, All
15:40 - 16:10	<b>Review of other areas of interest – Reports from monitoring "champions"</b> <ul style="list-style-type: none"> <li>• <b>Energy Efficiency/Savings</b> External Power Supplies (19.03.2014)</li> <li>• <b>Energy Efficiency/Savings</b> Battery Charging Systems (2012_09_03)</li> <li>• <b>Future Trends in Semiconductors:</b> Any new topics?</li> <li>• <b>Photo Voltaic</b> - Any update since presentation on PV-applications?</li> <li>• <b>HVDC Systems for Telecom</b> Need new champion to keep a watch of development of ETSI EN 301605 to report developments to the TC.</li> <li>• <b>Electronic Lighting/LED</b></li> <li>• <b>ROHS and WEEE</b> - Any update since re-issue Nov 2012?</li> <li>• <b>International Standards and Directives</b> – Any issues affecting EPSMA?</li> <li>• <b>IPC9592</b> MC agreed 8 Feb 2017 drop this as an agenda item as it is not generally seen as an issue now.</li> </ul>	Matti Armin Francesco, Jürgen All (Previously Markus) Arthur Jordan?  Armin All All All
16:10 – 16:40	<b>Other?</b> <ul style="list-style-type: none"> <li>• Do any EPSMA TC publications need update?</li> <li>• Contributors for new subjects e.g:  <ul style="list-style-type: none"> <li>• UL/EN62368 Guideline requested by MC</li> </ul> </li> <li>• Trade Barriers EU-USA. Any Alerts arising?</li> <li>• EPSMA Website – Quick Overview</li> </ul>	All All  All Paul
16:40 - 16:50	<b>Summary of actions from the meeting.</b> <b>Set next meeting and adjourn</b> Propose Monday xx November 2017, the day before the MC/AGM. Date to be decided by MC on 16 May 2017. TC Venue PULS GmbH, Elektrastraße 6, 81925 Munich? Note: 14-17 November 2017 is Productronica.	Paul Paul

19:30: Social/meal – Heilig-Geist-Spital (Restaurant over the River Pegnitz):  
<http://www.heilig-geist-spital.de/en/?Home>

**Present at the meeting:**

<b>Name</b>	<b>Company</b>	<b>Tel No.</b>	<b>Mail address</b>
<b><u>TC Members</u></b>			
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*Note: In the following minutes, any actions are indicated in blue after the respective item.*

## **Open meeting, introduction and review of agenda**

PC opened by welcoming the TC members to the first EPSMA TC meeting in 2017 and thanked everyone for making the effort to attend.

PC thanked Siemens for hosting the meeting and for the help from Annette Strobel for making reservations for the meeting room, hotel and restaurant, and for the lunch and refreshments.

There were brief introductions from everyone, especially for a new member, Esa Väkeväinen, representing Murrelektronik Power.

The agenda was presented and there were no new items requested.

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### **General TC status review**

The membership status, Appendix 1, was reviewed.

PC said that the MC on 16 May 2017 will review a list of prospective companies to invite to join EPSMA including exhibitors from Electronica 2016 and others suggested by the MC and TC.

TC members suggestions on 7 Nov 2016 for possible new members were put to the MC at the AGM the next day, 8 November 2016. The situation after the MC on 16 May 2017 is:

1. Bourn Magnetics in Cork: On follow-up after the 8 Nov 2016 MC, the secretariat agreed eligibility for membership and application forms were sent to Cathal Sheehan, Technical Market Manager, Bourns Electronics, email [cathal.sheehan@bourns.com](mailto:cathal.sheehan@bourns.com), tel +353 21 4515295, Nessan House, Bessboro Road, T12EY0X Cork, Ireland. Membership was approved by the MC of 16 May 2017.
2. UL: The TC felt we needed a safety company to advise the TC. Two suggestions were either Dennis Butcher from UL or another contact known to Dave Collins. The intention is to try to get UL to make a presentation and be available for questions. PC will ask the TC to send topics for a safety presentation.

**Previous Action from TC Nov 2016: Closed.** It was agreed at the TC there is no current need for a presentation by UL.

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### **Brief Review of Projects and Actions**

The previous minutes were viewed by the TC both to review the accuracy of the minutes and to review projects and actions.

The status of projects is summarised in the minutes.

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### **Approval of TC2-16 Minutes**

The previous minutes of TC2-16 held 7 November 2016 at PULS, Munich, were approved by DH, seconded by DC, with no changes requested by the TC.

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### **IEC 61204-7 edition 2.0 'Safety of Low-Voltage Switch Mode Power Supplies'**

#### **Background**

The TC endeavours to keep up to date with developments:

Thierry Pelikan of TDK-Lambda, Member of French mirror TC22X (Cenelec) and TC22 (IEC), has helped keep the TC and MC informed of developments. Also, TDK-Lambda safety experts raised questions about IEC 61204-7 Ed 2 and the implications to the industry of its issue soon.

The chairman of IEC-SC22E, Holger Laible, has kept EPSMA informed with presentations and answering questions at every April/May TC from 2013 to 2017 (MC present at 2015 TC).

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## Update on the Status of IEC 61204-7, 2nd edition from Holger Laible

PC presented a slide of the last status update on 17 January 2017 from Holger and he explained the current situation in more detail:

1. Extended version has been created: IEC 62477-1 and the IEC 61204-7 combined in one document.
2. The EN 61204-7 was voted positively, but there is an issue regarding the harmonization of all standards right now (for over 2 years), so we do have the same trouble to get the standard harmonized in the EU.
3. The translation of the document into German was completed February 2017.
4. At the moment, there is work going on to get the IEC 62477-1 accepted in US (UL standardization process).

Notes arising:

Ref 1 above, Other standards are also being published as extended edition, especially those produced by TC22 e.g. the UPS standard will follow IEC 62477-1.

Ref 2 above Holger explained that several hundred are blocked currently, and he emphasised that EPSMA can do nothing about the situation but should be aware. Delays are due to the requirement for Consultants to audit the documents and for example check compliance with the Low Voltage Directive where applicable. (Post TC, PC informed the MC 16/5/17 about this)

I response to a query from MR, as to why industry should follow 61204-7 instead of e.g. UL/EN62368, Holger explained how 61204-7 is specific to power supplies unlike 62368, and more standards are stating that compliance of power supplies with IEC61204-7 meets the requirements of their standard e.g. The machinery standard IEC 60204-1. Holger wants 61204-7 in 61010-2-201, and China, Japan and the EU are on board with this but the USA is still an issue.

It was felt by Holger that EPSMA should go for 61204-7 as it can be used for Industrial and Machinery standards. It needs UL to agree to certify products to it to recognise it is applicable. MR agreed to consider writing such a letter (to petition UL), which Holger offered to help with, after consultation with his management at PULS.

**Action: MR** to discuss the possibility of writing the above letter on behalf of EPSMA.

**Action: KC** to send an email in summary of the status update. **Action complete.**

**Continuing Action: PC** to keep contact with Holger Laible, Chairman of IEC 22E committee, and Thierry Pelikan to keep the TC up to date with IEC61204-7 developments.

## **UL508 and UL61010**

A letter listing concerns and petitions, written by MR and amended in consultation with the TC, MC and Kevin Parmenter of PSMA is to be sent to UL.

MR summarised the issues at the TC, and next day at the MC of 16 May 2017, the MC thought maybe the letter should be addressed individually to each of the three UL contacts listed rather than all three on each letter.

Paul Lee will investigate the most promising addressee to resolve this.

## **MOSFET and GaN Body Diode Reverse Recovery Parameters**

### *Background*

*Diarmuid sent an email to the TC chairman which included a section, Appendix 2, regarding MOSFET and GaN failures attributed to body diode.*

*He recommended that manufacturers include data sheet parameters of Softness Factor & Qrr with realistic current e.g. 10% of Id rated, di/dt = (10% Id rated)/(20 to 50ns).*

*Infineon and Texas Instruments were invited to comment and find a solution.*

*Francesco and Jurgen both agreed to work with their specialists to try to understand the failures and consider appropriate parameters.*

**Action Complete:** DH send waveforms to FD for Infineon comment.

**Action Continues:** JS to send DH info to the TI team and arrange a conference call with DH.

## **EPSMA and PSMA Collaboration**

At the TC of May 2016, DH agreed to ask Kevin Parmenter, a member of PSMA, how we could collaborate closer with our colleagues in PSMA i.e. in respect to white paper access etc.

**Update:** Kevin Parmenter brought this up with the PSMA Board of directors meeting. EPSMA were invited to say what we want to achieve and PSMA will consider it but they had no proposals of collaboration to offer EPSMA currently. A suggestion by DH was maybe share research with PSMA. During the evening social PC discussed possibilities with our guest, Kevin Parmenter, and we were invited to use the PSMA Database of Regulatory Standards which has free access. The idea of shared Research was mentioned though currently EPSMA does not have a surplus sufficient to fund research.

Discussions have also been made regarding both PSMA and EPSMA to both lobby UL on matters of common concern e.g. UL508 and UL61010 covered above.

## **EPSMA Guideline 'PFC Harmonic Current Emissions – Guide to EN 61000-3-2:2014'**

*[Milos Luptak (Champ), Arthur Jordan, Dave Collins and Diarmuid Hogan]*

The EPSMA Guideline 'Harmonic current emissions - Guide from the EPSMA' dated November 2010 based on EN 61000-3-2: 2006 is being revised to the latest version IEC 61000-3-2:2014 exists: <https://webstore.iec.ch/publication/4149>

The project was started at the TC Nov 2015 and a revision circulated 5 February 2017 was reviewed. Since then Milos has added a new colour flow chart and topologies for Single-Phase. Milos offered to add three-phase topologies to the report.

**Action Continues:** DC to tidy the report and add references to the source material by Tuesday 23 May.

(DC has expanded the introduction to include reference to above 16 Amp mains, and reviewed the report. DC also added helpful information and illustrations on harmonics, their sources, the effects of linear and non-linear loads, the effects of harmonics on different circuit types, and harmonic measurement.)

**Action Complete:** DH reviewed the report after the revision by DC and further review by DH of the references to be added is not felt necessary.

**Action:** PC Recommend to the MC that the new title 'PFC Harmonic Current Emissions – Guide to IEC 61000-3-2:2014' is changed by replacing 'IEC' with 'EN' because the report is all based upon the EN.

**Post TC: Action Complete.** The MC agreed with the change.

**Action:** ML Continue to champion the project leading to draft for final review a week after update by DC i.e. by Tuesday 30 May.

### **EPSMA Guideline 'CE MARKING GUIDANCE FOR POWER SUPPLIES'**

*[Dominique Hessmann (Champ), supported by Clemens Klemm and Michael Raspotnig, (final review to be done by Armin, Bernhard, Dave, Diarmuid, Esa, and Michael)]*

#### Background

A recommendation for update of the CE MARKING GUIDANCE FOR POWER SUPPLIES was made November 2014 by Dominique.

This guideline, issued in 2005, refers to directives that have been updated for a long time. Also, new LVD & EMC directives published in 2014 will be mandatory April 2016.

#### Progress

The guideline shown to the TC is greatly revised and includes decision tree/flowcharts to clarify this complex standard. Two issues raised by the TC are to be resolved before release for final review:

1. Include a summary of the applicability of WEEE Directive to CE Marking. It was suggested the Quality Manager at PULS, Friederich Haunschild, might write a few words to include in the report.
2. Consider whether the CE Marking Process should include different languages. Post TC, PC discussed this with the MC and it was agreed that we would make no reference to this in the report.

**Continuing Action:** DMH to Champion the CE Marking project to issue the draft update by Friday 19 May.

**Action:** MR ask Friederich Haunschild if he would write a few words on WEEE applicability to include in the report. **Action Complete.** Email sent 18/5/17 but Mr Haunschild is on leave until 22 May.

**Action:** PC distribute the guideline for final review completed by mid-June by **Armin, Bernhard, Dave, Diarmuid, Esa, and Michael.**

**Post TC:** the draft update from DMH was received 19 May 2017 and forwarded by PC on the same day.

**Action DMH:** Release the TC reviewed CE Guideline ready for MC review by mid-July.



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## Semiconductor Update – Infineon EV Charging Station Applications (part of the HP SMPS)

Francesco gave a presentation which included AC vs DC Charging, Battery Voltages (24V, 48V, 400V and 800V) and the China Incentive Programme which plans to have 5 million vehicles and 4.5 million chargers by 2021.

Despite the plan to have substantial growth in charging power, from 15kW to 30KW-60kW, the Power Supplies are required to remain in the same fixed form factor 19-inch rack mounted case size. Also shown was the worldwide differences in power connectors and that there are several different communication standards e.g. China, USA, Tesla etc.

**Action:** FD to send the presentation to PC to circulate to the TC and copy the secretariat for MC circulation and inclusion in the EPSMA Members Area.

**Action Complete:** FD sent it 23/5/17 and PC distributed it to the TC/secretariat the same day.

## Accurate Efficiency Measurements

*[Hubert Schoenenberger(Champ), Vlad Grigore, Milos Luptak and previously Andi Stiedl]*

This paper was released to the EPSMA web on 21 June 2015. After the November 2015 TC, the MC decided next day to release the paper and two associated Excel tools for free public download on the EPSMA website. These are now available to the public.

The report will be up-issued to add more detail on described measurement techniques and add other methods and revise the structure.

At a previous TC Hubert showed the new additions he had written on 3-phase power factor and the effect on voltage and phase errors in efficiency. He is unable to investigate the chapters DC/AC and AC/AC conversion which are not in the field of interest of PULS and would not be effective use of his time at PULS.

**Note:** The secretariat has contacted EPSMA University Members e.g. Nottingham University, to ask whether they could contribute to DC/AC and AC/AC conversion and the Power Circulation Method.

Similarly, Hannes Schachenmayr is trying to use his contact at ABB and possibly another source.

**Action Revised:** ML was to investigate the paper on the Power Circulation Method and write a section for the paper. Milos does not have the time to investigate this and he offered another possible solution:

**ML** to contact the University of Zilema to see whether their Power faculty would be interested.

Action **PC:** Send Milos the introductory notes from the TC and the paper on the Power Circulation Method to pass on to the university. **Action Complete.** PC sent the notes 23/5/17.

**Action Closed:** ML no longer has a contact at ABB Italy to try to get methods for 3-Phase.

**Action closed:** VG to contact ABB Finland to try to get methods for 3-Phase DC-AC and AC-DC. No result from ABB to end February 2017 and we agreed if no response by then we would abandon the effort.



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## Review of Other Areas of Interest – Reports from monitoring ‘champions’

### General Requirement of Energy Efficiency for External Power Supplies

*[Matti Kulmala]*

Matti sent his update, Appendix 2, and has updated one sheet of the database which will be added to EPSMA web documents when the remaining sheets have been updated and it will be kept up to date with any new changes.

**Action: MK** to complete the database update and send it to PC for EPSMA web release, and continue to keep a watch of the EPS standards and update the database when these change.

**Action: MK** to investigate the meaning of ‘Belarus registration required’ and inform DH and PC who will pass this on to the TC with the database update..

### Energy Efficiency Standards for Battery Charging Systems

*[Armin Wegener (Author)]*

- US Department of Energy (DOE) published 81 FR 38266 (June 13, 2016) with effective date June 13, 2018.

FRIWO have assessed the new DOE standard and concluded as follows:

- The test method, limit values and evaluation is clearly described.  
The evaluation and limits differ strongly from the CEC standard.  
Spot checks on existing CEC compliant battery systems (charger and battery pack) all also fulfilled the DOE standard. So in the end, the results are comparable.
- CEC was a clearly structured scheme which made technical and economic sense and is easy to follow! DOE is quite the opposite!
- FRIWO have sent technical questions to DOE however no reply yet.

The assessment in more detail is in EPSMA Members Area, titled ‘81 FR 38266’.  
Armin will update the database to show the changes.

**Action: AW** to keep a watch of the BCS standards and update the database when these change.

### Photo Voltaics

*[Previously Markus Hallenberger]*

No TC activity needed currently.

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## High Voltage DC Systems for Tele - Datacom and Data Handler Applications

[Previously Andreas Stiedl and Anders Petersson]]

[Background;

At the November 2011 TC, Anders said that Intelec, The International Telecommunications Energy Conference, held October 2011, probably revealed details on the subject. Also ETSI is looking into this area and obstacles foreseen are e.g. Infrastructure/Fuses/Security issues.

A driving application for the higher voltage is Blade Servers.

At the November 2012 TC, AP said there is a new draft to cover HVDC:

ETSI EN 301605: 'Environmental Engineering Earthing and Bonding of 400VDC Data and Telecom ICT Equipment'.

There is also ETSI EN 300132-3-1 V2.1.1 2012-0: 'Environmental Engineering.'

The TC previously decided that we should keep a watch of development of ETSI EN 301605.

AS commented at the November 2013 TC that demand for HVDC is coming from customers especially for power back-up. AS also explained that lightning strikes at outstations is a problem to HVDC when it results in arcing that is difficult to stop as there is no zero crossing as with AC power.

At the November 2014 TC, AS commented that interest seems to have decreased within equipment racks as distances are short and DC power losses in wiring are low. HVDC is used for outside installations and Data Centres where longer distances are involved. Problems with HVDC are lightning, as mentioned earlier, also corrosion.]

At the November 2015 TC, Arthur Jordan said he may be interested in working on this as Vicor are looking into HVDC. Vlad commented that Eltek has new products for HVDC and the EU has granted money to universities for work on the Microgrid.

The May 2016 TC alerted to the evolving 48VDC bus supported by OCP, the Open Compute Project, with members including Google, Facebook, Microsoft, AT & T, Deutsche Telekom.  
<http://www.opencompute.org/about/membership-organizational-directory/>

FD suggested EPSMA could contact Eric Persson, ex International Rectifier and Infineon USA, and involved with PSMA Roadmap Committee. This was raised with the MC but no follow-up taken.

### Previous Actions:

- **PC** to find a new champion for this evolving technology.
- **AJ** to consider what he might offer towards an HVDC paper.

**Action:** PH to talk to AJ to ask him what could be produced by Vicor to present a paper.

## Electric Lighting – LED applications

[Armin Wegener]

Armin offered to give a presentation at the November TC on DALI standard - IEC 62386 Digital Addressable Lighting Interface - See Appendix 4.

The presentation will primarily cover these parts:

Part 101: System

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Part 102: Control gear (applicable to control gear in a bus system for control by digital signals of electronic lighting equipment)  
Part 207: LED Modules (Device Type 6)

**Action: AW** to make above presentation at the November 2017 TC.

### **RoHS and WEEE**

This is at issue November 2012 and was revised by Friedrich Haunschild of PULS.  
The TC is not aware of any changes since issue.

### **Adoption of IPC9592**

– Full or selective compliance? What are our customers asking for?

For several years the TC was asked whether any members were aware of any issues regarding IPC9592. The MC agreed 8 Feb 2017 to drop this as an agenda item at the MC and TC as it is not generally seen as an issue now.

### **International Standards**

The TC was asked whether they knew of any developments affecting members.  
There were no new issues reported.

### **NEW PROJECTS**

*[To be formally approved/ assigned]*

The TC reviewed all TC publications, Appendix 3, to remind members of projects completed and to consider whether any released projects need revision.

The review/update of the two Database EPS and BCS recorded earlier in the minutes is ongoing.

Three TC Publications are now subject to revision as detailed earlier in these minutes:

- Harmonic Current Emissions (To be re-named 'PFC Harmonic Current Emissions – Guide to EN 61000-3-2:2014')
- CE Marking Guidance for Power Supplies.
- Accurate Efficiency Measurements.

The TC did not know of further updates needed to TC publications, Appendix 3.

There was suggestion that more of the publications should be made free to improve marketing of the EPSMA. PC raised this at the MC next day, 16/5/17, and some consideration will be given to the issue whilst keeping some publications 'purchase only' to encourage increasing membership to gain free access to the reports.

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## Possible new topics requested by the MC:

- **Quality Assurance of Firmware in Digital Power Supplies.**  
The TC was asked May 2016 whether they have any knowledge of this subject. At the TC Nov 2016, Christian said Siemens had not yet managed to recruit a person with responsibilities for firmware QA. An appointment has been made recently in 2017 and this issue may be followed up.
- **UL/EN62368 Guideline**  
PC asked the TC for suggestions as to how we might proceed with this. The conclusion is that the TC has no effort to proceed with work on Risk Management and the MC should be made aware if this. It was mentioned that a Google search of 62368 vs 60950 yields some helpful information.
- **Trade Barriers EU-USA. Any Alerts arising?**  
  
DH made comments with respect to Trade Barriers that it seems some agencies are not recognising the NRTL mark, or are making it difficult to agree recognition of the NRTL mark from other agencies, and asked whether any other EPSMA members are experiencing this?

**Action:** DH to send more information to the TC if he receives written confirmation from an agency.

- **EPSMA Website – Quick Overview**  
  
PC gave a short demonstration of the revised EPSMA web to show e.g. the information on the home page including 'Member News', 'EPSMA News', 'Latest Publications', 'Members Only', and where in the member's area the issues raised by Armin regarding **81 FR 38266** resides.

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## Any other Business

There was no other business.

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## Next meeting

The TC was informed that the next TC meeting will be the day before the MC/AGM in November 2017 and the MC will decided a date at tomorrows meeting.

The MC on 16 May 2017 decided that the MC/AGM would be on Wednesday 8 November at TI Offices, Freising.

Accordingly, the TC will be held on **Tuesday** 7 November (Arrive from 11:30 for meeting 12:00 ~ 17:00) at the new PULS HQ:

PULS GmbH, Elektrastraße 6, 81925 Munich. The nearest U-Bahn now is **Arbellapark**.

<http://www.pulspower.com/contact/how-to-get-to-puls/>

(Note: 14-17 November 2017 is Productronica).

#### Actions

**PC** to send invitations with a spreadsheet.

**All** to put the next TC meeting date in their calendar and please reply to the invites promptly to make it easier to arrange catering and restaurant reservation for the TC meal/social.

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#### Adjourn

The meeting was concluded at 17:06 with thanks to all members for attending, and thanks again to Siemens for hosting the meeting.

Later at 19:30, 13 of us met for an enjoyable social/ meal at Heilig-Geist-Spital (Restaurant over the River Pegnitz): <http://www.heilig-geist-spital.de/en/?Home>

## Appendix 1

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### TC Member Status, May 2017

**A total of 14 members from 6 countries:**



- Armin Wegener – FRIWO, Germany. (1/5)\*
- Arthur Jordan/Peter Huber – Vicor, UK/(Germany). (1/1)\*
- Bernhard Grub – XP-Power, Germany. (2/5)\*
- Christian Hoesch/Clemens Klemm – Siemens, Austria/(Germany). (1/2)\*
- Diarmuid Hogan, Excelsys, Ireland. (1/2)\*
- Dave Collins – Artesyn, Ireland. (2/2)\*
- Dominique Hessmann – Delta Energy Systems, Germany. (3/5)\*
- Esa Väkeväinen - Murrelektronik Power Oy, Finland (1/3)\*
- Francesco Di Domenico – Infineon, Austria. (2/2)\*
- Hubert Schoenenberger – PULS, Germany (4/5)\*
- Jürgen Schneider – Texas Instruments, Germany. (5/5)\*
- Matti Kulmala – Salcomp, Finland. (2/3)\*
- Milos Luptak – Bel Power Solutions, Slovakia. (1/1)\*
- Vlad Grigore – Efore, Finland. (3/3)\*

- **Esa Väkeväinen - Murrelektronik Power Oy, joined the TC January 2017**
- **TDK Lambda has been invited to provide a TC member.**  
**Thierry Pelikan attended the May 2013 TC and the TC in April 2015.**

\* Key: (x/n) = (Member # from each country / Number of members from same country)

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EPSMA TC report for MC 2Q17

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## Appendix 2

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### General Requirement of Energy Efficiency for External Power Supplies [Matti Kulmala, Salcomp]



- Ecodesign Directive is postponed due to Brexit
  - The effective date of new mandatory requirements in EU is unknown
  - Most likely Erp 2 voting will happen this year
- Natural Resources Canada (NRCAN)
  - Nrcan is under update
  - New requirements will follow latest DOE levels (level VI)
  - Amendment 14 will be published spring/summer 2017
  - New rules will most likely apply from beginning 2018
- Belarus
  - Belarus will adopt regulations for EPS 1.9.2017->
  - Same level as Erp level 5
  - All EPS should fulfill this already, but Belarus registration needed

The updated database is to be added to the EPSMA.

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## Appendix 3

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### EPSMA Publications – Public

(Accessible to the general public as a free download)



- Accurate Efficiency Measurements (Final, 2015-06-21)
- WEEE Decision Tree Guidelines (Nov 2012)
- RoHS Decision Tree Guidelines (Nov 2012)
- Power Factor Correction - Guide from the EPSMA (November 2010)  
N.B. This is now marked on [www.epsma.org](http://www.epsma.org) as 'New revision coming'.
- Thermal Measurements of Power Converters – How and Why? (March 2009)
- Guidelines to Understanding Reliability Prediction (June 2005)
- CE-Marking on Power Supplies - Guidance from the EPSMA (April 2005)  
N.B. This is now marked on [www.epsma.org](http://www.epsma.org) as 'New revision coming'.
- The Status of Lead-Free Electronics and its Impact on Power Electronics (Feb 2003)

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### EPSMA Publications – Members

(Not accessible to general public but some may be purchased)



- Energy Efficiency Database: Energy Efficiency No-load Consumption for EPS (Updated 19 March 2014)
- Energy Efficiency Database: Energy Efficiency BCS (Updated 3 Sept 2012)
- Safety Guidelines for Telecom Applications (Final, 3rd September 2012)
- Lead-free soldering – Concerns and Practices (Final issue 1F, 21 Feb 2012)
- AC-DC Power Supply Safety Guidelines for Medical Applications (November 2009)
- AC/DC Power Supply Safety Guidelines for Railway Applications (Nov 2008)
- AC-DC Power Supply Safety Guidelines for Power in Hazardous Locations (Jan 2008)
- HDPUg Applications Guidelines for Board Mounted Power Supplies (Feb 2007)
- AC-DC Power Supply Safety Guidelines for DIN Rail Supplies (Sept 2006)

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## Appendix 4

### DALI standard - IEC 62386

DALI is a worldwide standard, specified by the International Electrotechnical Commission (IEC). The DALI protocol is set out in the technical standard IEC 62386.

IEC 62386									
101 – General requirements – System (V1 & V2)									
102 – Control gear (V1 & V2)					103 – Control devices (V2)				
207 LED (V2 in progress)	208 Switching	209 Colour Control	in progress (control gear functions)			in progress (input devices)			
204 LV Halogen	205 Incandescent Dimmer	206 Conversion to DC (0/1-10 V)	222 Thermal lamp information	223 Light compensation over time	22x by colour type	307 Relative input devices	312 Feedback	333 Manual configuration	
201 Fluorescent (V1 & V2)	202 Self-contained Emergency (V2 in progress)	203 HD	219 Power measurement	220 Central emergency	221 Load shedding	304 Light sensor	305 Colour sensor	308 Remote Interface	
			216 Load referencing	217 Thermal gear information	218 Dimming curve selection	301 Push Buttons	302 Absolute input devices	303 Occupancy Sensors	

The DALI working party is not responsible for the publication dates of the standards. For information or updates on the current status of IEC 62386 standardisation, please contact IEC - International Electrotechnical Commission.

#### General requirements

- 101: System
- 102: Control gear
- 103: Control devices

#### Particular requirements for control gear

- 201: Fluorescent Lamps (Device type 0)
- 202: Self-contained emergency lighting (device type 1)
- 203: discharge lamps (excluding fluorescent lamps) (device type 2)
- 204: Low voltage halogen lamps (device type 3)
- 205: Supply voltage controller for incandescent lamps (device type 4)
- 206: Conversion from digital signal into d. c. voltage (device type 5)
- 207: LED modules (device type 6)
- 208: Switching function (device type 7)
- 209: Colour control (device type 8)