

IEEE P2520 Working Group Meeting #4 Minutes
22 July 2019 / 10:00 AM – 11:30 AM (EDT)

Teleconference

Approved: 9/9/2019

Members Present: Krishna Persaud, Troy Nagle, Susan Schiffman, Hua-Yao Li, Omer Oralkan, Jan Mitrovics, Peter Hesketh, Mike McGinley, Santiago Marco (9 voting)

Members Absent: Luis Hoffman, Radislav Potyrailo, Hugo Gamboa, Yogesh Gianchandani, James Covington, Howard Choe, Rachel Sunghee Lee, Susana Palma, Victor Huang (6 voting)

Staff: Vanessa Lalitte, IEEE-USA

1. Call to Order – WG Chair, Schiffman

The Agenda was displayed to the attending WG members at 10:00 AM EDT. WG Chair Susan Schiffman called the meeting to order at 10:03 AM. She welcomed the participants to the fourth meeting of the Working Group to develop an IEEE Standard for Testing Machine Olfaction Devices and Systems. An announcement was made about recording the session for Minutes-preparation purposes. The file will be destroyed after the Minutes have been approved.

2. Identification of Participants & Declaration of Affiliation – WG Secretary, Nagle

At each meeting, everyone present is asked to enter his/her name into the Chat window. New members are asked to include their affiliation and email address. Approval of the Minutes was delayed to the end of the meeting to allow additional members to join.

3. Approval of Agenda – Schiffman

The Agenda displayed at the opening of the meeting was adopted without objection.

4. IEEE Patent Policy – Schiffman

The WG Chair briefly reviewed the IEEE-SA Patent policy. This item is required for every WG meeting. Susan presented slide #3 of the set of slides located at:

<https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf>

5. Today's Discussion

- a. EU Odor Standards History: Santiago Marco provided a short review of the GOSPEL (General Olfaction and Sensing Projects on a European Level) Network of Excellence in Artificial Olfaction project from about 15 years ago. He and his colleagues used features described in IEEE 1451 to implement two prototypes: 1) a temperature-modulated MOX sensor array, and 2) a natural gas analyzer. The configuration of an enose using IEEE 1451.2 was described. The project used 1451.2 for network self-identification, BS-7986 for operating self-assessment and reporting, 1451.2 TEDS for seamless sensor replacement, and BS-7986 for fault detection/correction. A copy of Santiago's slides can be found at the following link:

<https://ieee-sa.imeetcentral.com/2520/folder/WzlwLDEyMDYzNTY2XQ/WzlsNjUyNzQyNDBd/>

- b. Conduct of WG Meetings: Troy opened a discussion about the conduct of our WG's future meetings. After discussions with Victor Huang and IEEE-SA staff, he proposed two different types of meetings: 1) Informational Seminars without Minutes, and 2) Official Business Meetings with Minutes. The details of the proposal are documented at the following link:

<https://ieee-sa.imeetcentral.com/2520/folder/WzlwLDEyMDYzNTY2XQ/WzlsNjUyNzQyNDJd/>

After a general discussion of the pros and cons, a consensus was reached to proceed with this new structure for our Fall 2019 WG meetings. We should develop a seminar curriculum.

Presentations could be categorized as hardware, software, sampling, and odor measurement. Jan, Krishna, Peter, and Troy will develop a proposal for the seminar series. The series can help create technical/general audience as well as general interest in our standard.

Action Item 7: Troy will initiate an email exchange with the Seminars Committee.

We should promote the new Seminar Series and the activities of the WG to our sponsors.

Action Item 8: Troy will publicize with the Sensors Council and Industrial Electronics Society.

Action Item 9: Jan will post the WG meetings and activities on the ISOCS website.

- c. Future IEEE P2520 Directions Questionnaire: In WG Meeting #3, James, Radislav, and Troy agreed to prepare a Questionnaire for surveying the WG to explore future directions for our standards effort. The Questionnaire was expanded by Krishna, and Susan distributed it to the WG. Eight members completed the questionnaire. Their responses can be found at this link: <https://iee-SA.meetcentral.com/2520/folder/WzlwLDEyMDYzNTY2XQ/WzIsNjUyNzQyNDFd/>

A general discussion ensued about the focus of the standard. Should we focus on odor applications? Can we narrow the focus onto an odor nuisance application that has a large market? The acceptance of the standard will be commercially driven. Can an instrument be implemented and manufactured using existing technologies and also be a commercial success? Outdoor environment odors (specifically waste treatment plants) are the current focus of European standards groups. This focus was chosen in part because it has a large potential market. Ambient air monitoring involves both odor and specific toxic gases. Animal production facilities generate odor nuisance to neighbors as well and gas hazards for the confined animals. Municipal garbage landfills also produce offensive odors and toxic gases. Odors are more difficult to monitor than are specific toxic gases. Matching a human panel's malodor response will be difficult for some of the most desirable application areas. If we choose odor as our first focus, we will be tackling the most difficult challenge first. If we can achieve that goal, we could then add combinations of toxic gases for specific applications into later standards in the series. If we select a specific odor application, say landfills, the instruments that meet our standards will be used by the companies/municipalities generating the odor, nearby residents being disturbed by the malodor, and government regulators who set odor limits for their geographic areas. Our standards for such an instrument could define test procedures to be followed. For a specific landfill, the instrument should be adaptable to detect specific odors that are being locally generated. What specific chemicals are being generated within the landfill? Is the instrument designed to detect those chemicals and their combinations? How does the instrument relate to human odor perception? How is the instrument calibrated? Does its output match human perception over time? Our first standard could define a method by which an odor monitoring instrument could be properly tested and calibrated. We could avoid giving specific design and implementation details. The draft European standard under development is answering three questions about the odor from a waste treatment plant:

- 1) Is an odor present (yes/no)?
- 2) If present, into what class is the odor assigned?
- 3) What is the intensity of the odor (as specified by the current European standard)?

Lab calibrations can be used to demonstrate that the instrument is working properly. Actual use calibration then takes place in the field. It may be possible for us to collaborate with the European standards group. If our first standard is for landfills, it could be modified/adapted for future versions targeted at other malodors (mold, animal production, etc.).

How can we proceed? We are opening a new series of standards, a prime standard and a series to follow. We must choose a couple of accessible first problems upon which to build, creating a

framework for future work. We can define solutions for a specific application like landfills, or we could define a more general methodology such as a calibration procedure with wide application. We might also examine currently used odor assessment methodologies being employed in industry (e.g., the Robinson test) and define a standard in that area. In summary, do we focus upon problems in a specific application or upon problems that apply in general to a number of different applications? Indoor air quality was suggested as a potent starting focus because a number of different nuisance odors can be present. Air exchange can be modulated to control odor and concentrations of CO₂ and other gas targets. Outside monitoring typically follows a known emission source with defined qualities that can be measured. Indoor applications can be quite different if the enclosed space is residential or industrial. Fire detection with chemical sensors in an important area as well. This area currently does not have any competing standards. The concept is to avoid false fire alarms due to nuisance odors. Fires produce very complex mixtures of volatiles making a solution difficult. Fires involving plastics generate large volumes of volatiles making early detection possible. A seminar in this area was suggested.

8. Approval of Minutes

At this point in the meeting, Troy indicated that a quorum was present. Susan asked that the Minutes of our July 8 meeting be approved as distributed. Those Minutes were unanimously approved.

7. Topics for Future Meetings - Schiffman

- a. Environmental Standards Efforts: This item will continue on our future topics list. Jan knows about some air quality initiatives that may be of interest to our WG. **Continuing Action Item 6: Jan will reach out the VDI (Tomas Poster, Emissions and Ambient Air Instrumental Monitoring initiative, CEN/TC264/WG41) to solicit collaborators.**
- b. Enose best practices: This item will continue on our future topics list. Can we find some veterans of early enose companies who can share their experiences regarding “what works” and “what does not” in this field?
- c. The enose market: This item will continue on our future topics list. Can we find an enose market expert to help us rate example use-case clusters?

8. New Business

There was no New Business.

9. Introduction of New Working Group Members

One new member, Santiago Marco, has joined our WG. Susan asked Santiago to introduce himself.

Santiago Marco, University of Barcelona: He is a Professor in the Department of Electronics and Biomedical Engineering. Santiago has been working in enose technology since 1994.

11. Future Meetings – Nagle

The next meeting was announced to take place at 10 AM EDT on September 9. Santiago and Jan may not be available.

12. Adjourn

With no other business being brought before the body, Susan thanked the WG members for their participation and adjourned the meeting at 11:30 AM EDT (<https://ncsu.zoom.us/j/945473904>).

H. Troy Nagle
WG Secretary
7/25/2019