ISO/TC 142/WG 9
Particulate air filter intake systems for rotary machinery and stationary internal combustion engines

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Convenorship: SIS (Sweden)

WG9 - Meeting minutes - Paris

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ISO TC142 / WG9/N186

Air filter intake systems for rotary machinery

Minutes of meeting in

September 25th, 2017, 09.00h – 13.00h

UNM, Paris, France

Note: blue back colour is used to indicate action items

Note: green back colour is used to indicate decisions

1. Opening of the meeting

Ulf opened the meeting at **09.00 hrs**

2. Roll call of experts

There were totally 25 delegates (14 experts and 9 observers, 1 liaison and 1 document monitor) documented at the meeting.

See separate attendee list, see **Annex 1**.

3. Adoption of agenda

The agenda was adopted.

6. ISO/PWI 29461-5, Air intake filter systems for rotary machinery - Part 5: Test methods for static filter systems in marine and offshore environments

Scott Taylor and Ulf Johansson reported the status of the project. See presentation, document N187 and N188.

The progress in this project is focused on phase 1 and 2, which is comprising development of the Challenge instrumentation and verification as well as the test methodology.

Research has been done on sea water composition, where the conclusion is that the droplet size should be in the 0.5 to 50 µm range in the PWI 29461-5. Research on equipment to generate droplet water spray has also been conducted where following types of technologies has been investigated:

Rotary atomizer, Aerosol generator, Internal mix atomizer (fogging nozzle) and ultrasonic nozzles.

The technology for water spray generation is suggested to be ultrasonic and Internal mix atomizer since these have the best probability to generate the water droplet sizes. Trials with these will be done asap.

The Convener presented the new, suggested proposal of test method which include using dry salt generation during the whole test, as well as intermittent water spray loading to simulate the off-shore/marine situation of an air intake. The method is quite easy to perform, not likely to be very time consuming, and is easy to automate. An ultrafine salt particle aerosol is generated by Laskin-nozzles and dried in a drying chamber. Separate water spray nozzles are used for the water spray.

There was concern that soot and or HCs may affect hydrophobicity of fibers. However, no information was available on the meeting. The experts are encouraged to provide any such information to the Convener and the project leader.

Expert Thomas Caesar was of the opinion, that ISO is not in business of research but to harmonize national standards. The convener did agree that it would be preferable to have ready test methods available to pick, but ISO should be positive to encourage development initiatives if no such methods were available.

Other comments:

It is not trivial or cheap to control RH to low levels in this current test set up but this may not be needed. The question of adding oil and/or dust will be discussed and evaluated as a next step.

Decision:

A. Continue with development

(NWI to come later, the current Work will continue as a PWI)

Action:

- Scott, Ulf, ETN - members to continue development of test method using the latest suggestion (N188) as a base.

7. ISO 29461-2, Air intake filter systems for rotary machinery — Test methods — Part 2: Cleanable (pulse jet) filter systems

Task group meeting in December concluded that there was little energy from the project leaders of part 2 (and 6) to continue the work.

There are existing methods for system test like ARAMCO etc. however with proprietary test methods it is difficult to develop a similar method without agreement from the IP owners.

Possibility that ARAMCO wants to join WG. Stephen Hiner commented that people from Aramco has joined the TC142, however not as experts to the WG9. The convener will contact these people to see whether they are interested to join the WG9 work.

A Part 2 revision suggestion was presented by Chris Fischer. The suggestion was to make a simplified approach (compared to the existing part2), using a generic configuration of a pulse system (to be defined) able to test different type of filter elements enabling users to compare between different filter solutions. This is the same presentation as was shown in the WG9 meeting in December 2016 - see N189.

Comments on the suggestion:

Jack Clemens: "It can be done. There are a limited number of configurations in common use.

Difficult to do vertical flow in lab without making mess).

One of the coming important decisions will be to select standardized valves or allow variation. This can however be done and tested without large investments.

The final question was if the WG9 should do something for pulse cleaned filters (systems) or not. Four alternatives were brought up by the Convener:

1) Restart the part 2, with the same scope
2) Change the scope and define what we practically can work with – start a new work item
3) Stop work until new suggestion, catch up in meeting two months from now
4) Stop all work in this field (mentioned)

Decision:

A. Change scope of part 2 and restart with new scope [option 2)]

Action:

- Get feedback from ETN regarding a generic system test.
- Task group: Chris Fischer (project leader), Ulf Johansson, Thomas Caesar, Keith Morris (BSI)
- Contact ARAMCO: Ulf Johansson
- An interim meeting to be called

7. ISO/PWI 29461-6, Air intake filter systems for rotary machinery - Part 6: Cleanable (Pulse) filter elements

Decision:

A. Becomes obsolete based on new direction for part 2. Details to depend on ISO procedure.

Action:

- Ulf Johansson to work with ISO (Anna Martino) to determine procedure to let part 6 stop and to redefine part 2

9. Work Plan for WG9

Action:

- Restart work on Part 3 - Integrity test/mechanical strength ("ISO/PWI 29461-3, Air intake filter systems for rotary machinery – Part 3: Test methods for mechanical integrity of filter elements"
- Task group: (project leader) Steffan Trnetschek, Thomas Caesar, Jack Clements, Manfred Sauer Kuntze, Stephan Hiner
- Need to define scope (what parameters to test - this will be defined in the PWI work
- First step for project leader is to Collect and create of list existing methods to test integrity.

10. Action points

See above

11.Any other business

New PWI was suggested by Tomas Caesar;

"A breach test, to see how the integrity of the filters are working at the limit of the operational envelope". This means basically when do the filters start to break. This can typically be done in different ways, either under high pressure differential and/or very high air flows. In addition, temperature and other environmental parameters may affect the integrity.

To start this work, it was suggested that first the project leader should investigate any current practices used in the air filter industry today, or in other industries if applicable. All experts were asked to bring in information concerning this.

It was decided that a new work item should be started (reactivate a previous work item "**ISO/PWI 29461-3, Air intake filter systems for rotary machinery – Part 3: Test methods for mechanical integrity of filter elements"**

Steffan Trnetschek was accepting to be the project leader for this work.

An additional request on revisit the part 1 was made but the decision was not to do this at this point of time. The reason is that the idea behind the WG9 work is to create a common way of how to measure and define efficiency of filters and systems that protect rotary machinery. In the rotary machinery (gas turbines) there is a need for filters that have higher efficiencies than what is expressed in the ISO 16890, (EN779 – to be replaced) or ASHRAE 52.2. The current part 1 define measurement of efficiencies > 99% at submicron sizes.

A Presentation was made by Dr. Chan from National grid i.e. Power distribution concerning the Part 7, results on testing, N190.

There should be a need for fog test, however some similarities to part 5. Filter response depends on natural / ambient aerosol loaded on filter is an important parameter to address.

This item is still PWI.

12.Next meetings for WG9

Next WG 9 meeting planned:

- November 30 (WEB)
- March 30 (WEB)
  Task groups will meet on an on-demand basis.
- Plenary meeting 2018, in Bejing.

13.Closure of meeting

Ulf closed the meeting at 12:27 hrs

Minutes of meeting submitted by Bruce MacDonald/Ulf Johansson

2017-09-25

Attendance list

Annex 1

Member body	Name and First Name	e-mail	Attended as
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