

CEC ACTIVITY REPORT JULY - DECEMBER 2018

1. Chairman's Introduction

The CEC Management Board hopes this Activity Report will give you a good understanding of our work and the progress we make.

In our June Management Board meeting we drafted the outline for the 2018 CEC Workshop. As I am writing this introduction our 2018 CEC Workshop is behind us! More than 45 participants from the automotive, lubricants, additive, fuel and testing industries joined us in Brussels to learn what progress we have made since our 2016 Workshop and what remains to be done. This latter question was addressed during 8 breakout sessions where we discussed the effectiveness of the CEC Working Groups. In the morning the 4 discussion groups were organised by the test type: fuels, transmission lubes, lubricants bench and lubricant engine tests. The afternoon groups were organised by group type: Special Project Group, Test Development Group, Surveillance Group and Support Group. The aim was to understand if these groups have different needs and what support is needed from the Management Board. The discussions were very animated, and many flipcharts were filled with suggestions, ideas, do's and don'ts. On behalf of the Management Board, I want to thank all the participants for their active participation and excellent input, which will serve as the basis for the CEC focus items for 2019 and 2020. More to follow on this in our next Activity Report!

A 2019 focus area will be the CEC website. Initial meetings have taken place outlining the objectives and the nature of the changes. More details further in this Activity Report.

2. List of Board Members and Responsibilities

2.1. List of Board Members

Frank Stunnenberg	ATC (Chairman) stepping down early 2019
Mike Conroy	CONCAWE (Vice-Chairman)
Bengt Otterholm	ACEA
Paul Decker-Brentano	ACEA
Nigel Britton	ATC
Uwe Zimmer	ATC (temporary)
Nick Clague	ATIEL
Nikolay Doroshenko	ATIEL
Maximilian Staudacher	CONCAWE

The CEC Management Board underwent a significant change with Vincent Panel (ATIEL), Adrian Fitzpatrick (ATC) and Thomas Buenemann (ATC) stepping down. Their positions have been taken by Nikolay Doroshenko (ATIEL), Nigel Britton (ATC) and Frank Stunnenberg (ATC) respectively. However, for the moment Frank will stay on as CEC Chairman until a successor has been found. During that period Uwe Zimmer will be the 2nd ATC representative.

2.2. Management Board Responsibilities

Issue	Leader	Backup	Admin, Secretariat
General Administration, Finance	Frank	Mike	Kellen
Monitoring Lubricants Groups (SG)	Nick	Nikolay	Kellen
Monitoring Fuels Groups (SG)	Max	Mike	Kellen
Monitoring Transmissions (SG)	Frank	Nick	Kellen
Monitoring Reference Fluids Groups + Rating	Nick (Lubes) / Max (Fuels)	Mike (Fuels)	Kellen
Constitution	Frank	Mike	Kellen
External Communications	Frank	Paul G.	Kellen
Quality/SDG	Nick (Lubes)/ Mike (Fuels)	Max (Fuels)	Kellen
Lubricant Tests:			
TDG-L-107 - Sludge	Nigel	Paul	Kellen
TDG-T-108 - Pitting	Frank	Nick	Kellen
TDG-L-114 – Toyota TCCD	Paul D-B	Bengt	Kellen
TDG-L-115 – Bearing Wear Test	Bengt	Nigel	Kellen
TDG-L-116 – Ring Liner Wear Test	Nigel	Bengt	Kellen
Fuel Test Development:			
TDG-F-113 - IDID	Max	Mike	Kellen
SPG – GDi Wear	Nick		Kellen
SPG – Corrosion Test	Nick	Bengt	Kellen
Confidentiality Issues	Frank	Mike	Kellen
CEC Future Role	Frank	Mike	Kellen

3. Update on TDG's - Activity report – timeframe July - December 2018

3.1. TDG-F-113 – DISI test

With regards to the fuel test development, the most recent engine tests performed at the lead lab with non-ethanol containing fuels show promising deposit forming performance with results close to the target specified in the terms of reference. In the next steps ethanol containing fuels will be tested. The TDG have commented that if the initial High Fouling Target is not feasible for ethanol containing fuels, a new lower fouling target would have to be considered as an option. However this can only be decided based on the results of the next tests with ethanol containing fuels.

The engine test development should be finished by the beginning of April 2019.

With regards to the injector availability, due to production issues there is a significant delay on the injector supply. The progress in the test development should not be affected by that so far.

The next TDG meeting will take place on 12th of February in Ludwigshafen (BASF).

3.2. TDG-L-107 – M271 Sludge Test

Good progress has been made recently. With low calibration oil the test does produce sludge within the targeted running time. The oil consumption issue is now fixed and oil consumption is now as expected and ring stick results are also in line with expectations. Repeatability and discrimination have been demonstrated on fuel batch 6. This fuel batch has now been consumed.

The proposal is to blend a new batch. APL will run high and low calibration oils on the new fuel batch to hopefully reconfirm discrimination.

The CEC MB has accepted the TDG to move to Phase 2 on the understanding that:

- APL will run the first two RR tests
- The first test on RL262 to set the test length
- The second test on Oil C to prove discrimination

- Once complete and discrimination is confirmed allow continuation of RR

A TDG L-107 meeting was held on 4th December to finalise the plan and appoint the new TDG Chair (see: Chair Appointments TDG's).

3.3. TDG-T-108 - Pitting Test

During the RR Large, unacceptable scatter of test results and further investigations to find root cause of the scatter were done. It was suspected that FVA 2A has an unstable micro-pitting behaviour at 90°C and is thus not a suitable low reference oil under the standard test conditions (90°C).

An intensive search for new low reference candidate fluids was done and two new candidate fluids have been proposed and initial testing was done with both candidates and CEC RL272 was selected.

For the high reference oil CEC RL273 is a fully formulated finished fluid, designed for dedicated MTF applications.

The results from the second RR were as follows:

- Comparable tooth flank condition with typical pitting failure and only (very) limited micro-pitting
- Acceptable scattering
- For the high reference oil, there is a questionable result for lab F and it is not clear if this is a possible outlier
- Good discrimination between reference fluids

The statistical evaluation shows that there is no statistical valid data for repeatability r due to too few data points it as the testing takes a long time.

In terms of the next steps, the TDG has finalized the work on the draft procedure and has asked the CEC MB for approval.

The CEC MB acknowledged this is really good progress and thanked Thomas Tobie for the excellent leadership work.

3.4. TDG-L-114 - Toyota Diesel Turbocharger Compressor Deposit test proposal

On the hardware side, ISP has agreed to order 100 engines and 1.000 turbochargers. 20 engines per month will be delivered at ISP.

The fuel supplier was selected and the first fuel batch has been blended and shipped. There are 8 Round Robin (RR) test runs planned, 4 at each laboratory.

One lab (A) has completed the first RR tests, with results in line with expectation. The TDG meeting scheduled for October was postponed because the other lab (B) could not provide the results on time. Lab A also stopped after the first 2 runs in order to wait for Lab B results of the first two runs. If all results are fine, then a release of the CEC Test Method is expected in Q1 2019.

3.5. TDG-L-115 – Low Soot Bearing Wear Test

At its last meeting, the TDG selected IST Prüftechnik as lead lab and confirmed the estimated amount for the test development. The call for sponsors was launched and 11 sponsors are confirmed.

The challenges for the TDG are:

- No low calibration oil available
- Borderline calibration oil – low vis oil
- Phase 2 round robin – test rig costs

The CEC MB suggested the TDG to continue searching for a suitable oil that is within the Terms of Reference.

In case no oils will be available, the CEC MB will look at changing the ToR.

In early 2019 the TDG will have contact with the hardware suppliers, and start in February with the testing.

3.6. TDG-L-116 –Low Soot Ring Liner Wear Test

ISP has been selected as the lead lab and 11 sponsors are confirmed.

From the Terms of Reference the first challenge was to collect all information about the test rigs used in the different labs. In order to find this out the group agreed to send out a questionnaire and collect all data

about these rigs. The results of the survey showed that all rigs fulfilled the ToR and costs were comparable. The Optimal SRVTM equipment was chosen and is available in 5 labs.

On test parts, the liner material will be supplied by Mahle and the piston rig by federal Mogul.

A minimum of two calibration oils would be needed and there is currently no existing CEC oil suitable. The group is currently looking for oils that have already been tested in the field. Two oils have already been tested by MAN and they are giving different performance. These 2 oils are still available and can be used for the test development.

As the test condition of the test rigs are not yet fixed the oils with in-service experience will be needed.

The timeline shows that everything is working according to plan.

4. Update on SG's - Activity report – timeframe July - December 2018

4.1. SG-L-036 - The Measurement of Lubricants Dynamic Viscosity under High Shear Conditions

The CEC MB has reviewed the effort carried out by the L-036 Surveillance Group to extend the method from 150°C to 100°C.

The CEC MB commended the work done by the SG and supported the suggestion to expand the L-036 method with HTHS testing at 100°C These changes have been implemented in the method.

4.2. SG-L-104 & SG-L-099

The next batch of engines will be built in January/February and sent to the test laboratories. However, from mid-2019 all Russian supplied hardware will be stopped due to the issue of US embargo on Russian built hardware to the USA. Daimler is investigating options to keep the hardware active for these tests out to 2022.

4.3. SG-L-106 & SG-L-111

The sponsoring OEM will stop producing engines at large scale by the end of 2019. However, the OEM is willing to continue supporting the industry with L-106 and L-111 hardware out to at least 2022.

4.4. Chair Appointments TDG's

TDG-L-107

The nomination of Timothy Hadaway as successor to Adrian Fitzpatrick as Chair of TDG-L-107 was endorsed by the Management Board in November.

5. Events and representation

5.1. CEC Workshop – November 28th 2018, Brussels

On 28 November 2018, CEC held its second workshop in Brussels. The event was very successful and around 50 participants were present. Very interesting and valuable contributions were given and useful discussions took place.

An update was given on the strategic initiatives that came out of the first workshop in 2016, as well as an overview of the roles & responsibilities of the CEC MB and working groups.

Several breakout sessions were held; in the morning they were organized around product area (fuel tests, lubricant bench tests, transmission tests and lubricants engine tests) and by working group type (TDG, SG, SPG and support groups) in the afternoon.

The presentations of the workshop are available on the website and can be accessed from "My CEC" in the section CEC Information/Presentations/CEC Workshop – 28 November 2018.

In terms of next steps, the CEC Management Board will look at all the input and the feedback received and come up with a proposal on addressing the issues for the coming years.

6. Strategic Outlook

6.1. Fuel Test Development

Following the recent CEC Fuel Test Developments, F-110 and F-113, contact with the CONCAWE science representative and other previously communicated initiatives; all identified short term actions have been taken. The activity will continue with opportunities being sought to start new test developments. Contact with the relevant CONCAWE groups will be maintained on a regular basis. Other opportunities to identify

new contacts will be taken if and when identified. The last initiative was to reach out to suppliers of Fuel Injector Equipment so CLEPA has been contacted. They have responded that they need more time to investigate internally so if there is no interest from CLEPA, this item can be closed.

6.2. Enhancements to CEC Test Development Process

All aspects of the test development process have been thoroughly reviewed. Two focus areas were identified:

- Test Development Process enhancements, including guidelines for the development of ToR and the formation of Special Project Groups to develop ToR, focus on project management skills when selecting TDG chairman and increased focus by the TDG on the project deliverables and timeline.
- Support to the TDG by CEC MB, including focus on support to the TDG by the CEC MB liaison, closer monitoring of TDG progress by the CEC MB and more active issue resolution by the CEC MB.

These improvements have been captured in revised Guidelines, which have been issued to Chairs and vice-Chairs of the TDG's and SG's. Feedback on the revised Guidelines has largely been positive.

In some instances where development of quality Terms of Reference (ToR) was deemed complex, Special Project Groups were tasked with developing ToR to avoid clarity issues within the TDG. Examples are Corrosion SPG and GDi Wear SPG as well as SPG's for Low Soot Bearing Wear (now TDG L-115) and Ring-Liner Wear (now TDG L-116). There are no further actions planned so this strategic item has been closed.

6.3. OEM Management

The current situation is that there is limited OEM involvement in engine tests development: only Daimler, PSA and VW and lately also Toyota provide CEC with hardware supply and technical support.

Some additional ACEA companies are also members of lab and rig test development groups but many ACEA members have little or no practical experience with CEC.

The CEC Management Board has therefore reached out to the ACEA member management by:

- Email communication in April 2017 to ACEA Joint Committee (JC) and Commercial Vehicle Joint Committee (CVJC) members and selected additional key OEM managers requesting support for lubricant test development and HW supply and support. Little or no response.
- Requests to ACEA WG-L and ACEA WG-L LD and HD task force members to investigate with their respective management whether they would welcome CEC representatives to visit and present CEC and discuss the importance of OEM involvement. Little or no response.

Further actions taken:

- Questionnaire sent out to ACEA TF-LDL and TF-HDL to solicit ACEA member awareness and understanding of CEC as well as their views on supporting CEC.

6.4. Activities of the SG's

The following items have been completed in view of the strategic item on the activities of the SG's:

- Some tests were moved to TMS. Will continue, mandatory for new tests.
- Test Life Plan was introduced
- Worked on reliable hardware supply
- Publicize non-confidential test method information for non-members

The following is still planned to come:

- Significant update of Guidelines
- Recommend Chair to use Guidelines during SG meetings
- We hope to provide training/information sessions for group members
- Must do's, Should do's, Don't do's

6.5. CEC Role in engine hardware supply

Supply of engine hardware for CEC tests is not a trivial matter but is essential for our industry. Last year, the CEC MB has reached out to European stakeholders in engine hardware supply to understand the situation in Europe, which proves to be diverse, but nevertheless there is a role for CEC in facilitating hardware availability in Europe. The CEC MB has endorsed the ToR for L-114, the Toyota Turbo Charger Compressor Deposit Test, welcoming Toyota as a new hardware sponsor. Toyota, ISP and CEC have

agreed that hardware storage and supply for this test will be handled by ISP as a test case. Another area of CEC's involvement in part supply is currently being scoped.

6.6. CEC Stakeholder Engagement

The following items have been realized in the area of communications and stakeholder engagement:

- An inventory of external stakeholders was created with rating and communication channel
- CEC Chair addressed 9th Annual European Base Oils & Lubricants Interactive Summit, which took place on November 2017 in Antwerp
- Semi-annual updates on progress regarding strategic items to AAC by the CEC Chair
- Existing communication channels were reviewed
 - CEC Newsletter frequency harmonized to quarterly issue
 - CEC Test Status & Life Plan was revamped (input for AAA meeting)
 - CEC Website survey conducted and kick-off for re-design effort
- New communication channels
 - Developed semi-annual CEC Activity Report
 - Semi-annual CRC Engagement

Also stay tuned for the new CEC Website which is under development. Some first meetings have taken place internally and with PDC. A taskforce within the Management Board has been setup to focus on this project. The first designs and wireframes have been created and more information on the timeline and estimated launch date will be communicated shortly.

7. Upcoming event and activity for the 1st semester of 2019

- Management Board Conference Call on January 22nd , 2019
- Management Board Meeting on March 19th, 2019 at CEC offices in Brussels
- Management Board conference Call on May 9th , 2019
- Management Board Meeting on June 18th, 2019 at CEC offices in Brussels
- TDG-F-110 and F-113 meetings on February 12th and 13th , 2019, at BASF, Ludwigshafen, Germany
- SG-L-054, SG-L-099, SG-L-101, SG-L-104 Meetings on 13th & 14th March, 2019, at BP, UK
- SG-L-103 Meeting on 19th March, 2019 at SGS Frenesius, Taunusstein, Germany
- SG-T-07 & SG-T-84 on 26th March, 2019 at FZG Institute, Garching, Germany
- SDG Meeting on 14th May, 2019 at APL Landau, Germany
- Bundled Meeting on 15th May, 2019 at AL Landau, Germany