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Members of the ESCIT PEI Task Group:

Brad Cosgrove (Chrysler)	Wangkan Lin (Infineum)	Ted Selby (Savant)
Joe Franklin (Intertek)	Jim Linden (GM)	Jerry Wang (Oronite)
Greg Guinther (Afton)	Ron Romano (Ford)	Lew Williams (Lubrizol)

Minutes of the Telephone Conference 2007 August 1

The Phosphorus Emissions Bench Test Group met by telephone conference on August 1, 2007. The following are the Minutes of that meeting.

For a third time, Jim Linden's good offices provided GM telephone conference facilities for the work of the Task Group. All of the comments and discussion contributed at this meeting were recorded by the Chairman during the course of the meeting and these Minutes are based on the contents of the recording. Ted Selby, who is acting as Chairman/Secretary of the conference would appreciate knowing and correcting any errors made in these Minutes.

Attending

The meeting started at 3:30 PM to accommodate two of the Task Group member who had a conflict in their schedules up until 3:00 PM. Present at the initiation of the meeting in addition to the Chairman Ted Selby (Savant), were Members Greg Guinther, (Afton), Lew Williams (Lubrizol), Brad Cosgrove (Chrysler), Joe Franklin (Intertek), Wangkan Lin (Infineum), and Ron Romano (Ford). Task Group Members Jerry Wang (Oronite) and Jim Linden (GM Research) were able to individually join reasonably soon after the meeting was underway.

In addition, there were four guests: Mike McMillan, consultant to Infineum, Larry Smith of Infineum, and Bob Olree and Matt Snider of GM PowerTrain.

1. Agenda items

The Chairman asked if there were any suggested additions to the Agenda that had previously been sent (attached as Appendix 1). It was noted that some of the present attendees might not have received either the Agenda or the results of the completed extended-time PEI studies (Appendix 2) and that the group participating in the phone conference should take that into account during the meeting. No other comments were offered.

2. Acceptance of previous Minutes of July 16 phone conference

The previous minutes were accepted by the Task Group.

3. Discussion of the time-extended PEI data sent by E-mail

a. General observations – all participants

The Chairman opened dialogue on the completed 48-hour extended-time PEI study results sent for review before this meeting (Appendix 2). He mentioned that Greg Guinther had already sent out a further view of the data (Appendix 3).

The first observation by Wangkan Lin was that the response of the Lubrizol 'Conventional' oil was unexpected. Greg Guinther observed that a decrease in PEI did not seem reasonable. Wangkan thought that the 48-hour data on this oil should be repeated. Otherwise, Wangkan thought the data looked acceptable with some oils showing essentially flat lines indicating no change in PEI and consequently no further emission of phosphorus while others showed increasing levels of phosphorus volatility with increasing time.

Greg Guinther observed that Wangkan's comments could be visualized in the plot Greg had presented in the E-mail sent to the group early this afternoon (Appendix 3). He had re-plotted the PEI(165) data sent by Ted Selby (Appendix 2) using incremental change in PEI at 32



and 48 hours by subtracting the 16-hour PEI value. In this approach, he avoided the possibility that the data reported for each time period could be viewed as additive rather than cumulative.

Jerry Wang joined the Task Group at this point and the Chairman asked Wangkan to restate his comments for Jerry's benefit.

After this review, Brad Cosgrove commented that he had treated the collected PEI data somewhat differently than Greg Guinther. Brad's approach was to find the change in PEI(165) between the time intervals. He noted that some of the oils like JAMA #5 seemed to be increasing in phosphorus volatility between 32 and 48 hours. Obtaining 64-hour data on such oils to see if the trend continued or flattened out would seem to have merit.

Greg Guinther inquired about when the JAMA oil engine data would be available and whether the oils were 'real-world' formulations. He noted that Afton's FT-33 was not 'real world' oil and that the Task Group would want to be careful not to form conclusions based on oils that may bring in artifacts unique to their formulation.

Ted Selby answered that it was his understanding that the JAMA data would be available following their meeting in Japan which occurred a few days past. Jim Linden had indicated that either he or Hannah Murray would send the data as soon as JAMA permitted release. Jim was expected to join the group momentarily and could answer the questions at that time.

In fact, Jim joined the meeting of the Task Group and was asked about the availability of the JAMA data. Jim now has the data but has not had an opportunity to plot the JAMA engine performance data against the PEI values just sent out. However, he noted that in regard to the PEI(165) data at 16 hours at the two temperatures of 85° and 135°C, correlation was not as good as he would have hoped.

Jim said he would send the report out with PEI data obtained at 165°C at 16 hours to the Task Group tomorrow and the Chairman expressed appreciation.

b. Decision on generating 64-hour PEI data

Wangkan Lin thought that further PEI data should be generated at 64 hours. Jim Linden commented that he could see 64-hour tests on certain oils. In the ensuing dialogue, the oils JAMA #2, JAMA #4, and JAMA #5, the Lubrizol Low Impact, as well as the Oronite Low PEI oils.

Discussion switched momentarily, first to the PEI results on the Lubrizol 'Conventional' oil and its peculiar behavior at 48 hours, and then to the meaning of the yellow highlighted data in the table sent out to prepare for the meeting (Appendix 2). In regard to the latter, Ted Selby explained that one of the instruments had suddenly failed but that the cause of the problem by which it failed could have been progressive. This possibility led to questions within the Savant Labs concerning data on other oils recently run in the instrument. The three yellow-highlighted values show those oils which had been run in this instrument prior to its failure. (It was noted that these oils were to be re-run by Savant to check their previous PEI values).

Jim Linden asked about the instruments and their vintage. Ted answered that two of the instruments were older and two were of the recent model manufactured by Tannas.

Returning to the discussion of the PEI(165) value at 48 hours on the Lubrizol 'Conventional' sample, Jim felt that it should be rerun. Ted agreed and further observed that the first sample of this 'Conventional' oil received in 2006 and at that time had been analyzed at 165°C at 16, 24, and 48 hours. (These earlier data were included in the first table of data sent to the Task Group preceding the second phone conference on July 16th.) This first sample of the 'Conventional' oil had shown progressive values of PEI over the time intervals. It was apparent that there was need to reanalyze the most recent sample of the 'Conventional' oil.

Brad Cosgrove noted that the original 'Conventional' sample had given a PEI(165-48) value of 149 mg/L whereas the most recent data showed a value at 48 hours of 78 mg/L a difference of 71 mg/L. Ted Selby responded that this difference did not reflect the precision shown by the instrument and again was a reason for re-analysis.



At this point the Task Force turned to consideration of the oils that might be suitable for 64-hour PEI tests. After discussion the following oils were selected on the basis of their continued increasing values of PEI(165) with time:

JAMA #2, JAMA #4, Lubrizol’s ‘Low Impact’, and Oronite’s Low PEI. In addition, there would be a repeat of the 48-hour test on the Lubrizol ‘Conventional’ sample. Further, there was a request for a 48-hour test on JAMA #5 which was also agreed to by the Task Group.

Another question about data on the original Lubrizol ‘Conventional’ oil data at 16, 24, and 48 hours sent earlier to the Task Group led the Chairman’s to agree to add this data to the table in Appendix 2.

4. Further data on pertinent engine and fleet data

a. Jim Linden on JAMA oils

Jim had already taken care of this issue earlier in the conference.

5. Shipments of samples from Savant Labs for phosphorus analysis

During the previous phone conference on July 16th, the Task Group considered Jim Linden’s question of whether the ICP method used to calculate the PEI might make a difference in its value. Savant Labs use ASTM Method D 4951. The Task Group decision was to have the volatilized PEI samples run by both ASTM Methods D 4951 and D 5185 in other laboratories. After the previous conference, this decision was ultimately narrowed to two labs, Afton and Intertek with Greg Guinther representing the former and Joe Franklin representing the latter.

Greg was to receive samples of all eight fresh oils and as many of the volatilized oils as possible depending on the quantity generated during the PEI tests. Any remaining volatilized material of sufficient volume would also be sent to Joe.

At the July 16th conference, the decision was made to limit the elements to be determined to calcium, phosphorus, and zinc, except for Intertek. The latter would determine all elements in the fresh oils and as many of the volatilized samples as available with the purpose of supplying this information to Brad Cosgrove under confidence. In response to a question from the Chairman, Joe confirmed that this was also his understanding.

a. Shipping underway

Ted Selby reported that fresh and volatilized samples were sent to both Greg Guinther of Afton and Joe Franklin of Intertek since the last phone conference .

i. Afton (Greg Guinther)

Greg Guinther reported that his laboratory completed ICP analysis and he returned his first set of ten analyses of the volatilized samples to Ted Selby today. Jim Linden asked if the elements analyzed were limited to calcium, phosphorus, and zinc and Greg confirmed this. Jim Linden also asked if the analysis of the samples by Greg’s laboratory was by ASTM D 5185 and Greg confirmed this.

Lew Williams asked about Afton’s disposition of the fresh oil samples and they agreed that the samples would simply be poured into waste oil containers.

ii. Intertek (Joe Franklin)

In response to Jim Linden’s inquiry, Joe Franklin, Joe indicated that he can run both D 5185 and D 4951 and Jim thought that if Joe would do this, it would be even better.

The Chairman momentarily digressed to a related item that normally would come under New Business and observed that the Task Group had approved of Brad Cosgrove receiving the full ICP analyses of all eight fresh oils under confidential restrictions from Joe Franklin’s work at Intertek.

b. Return of information to Savant Labs

Chairman Ted Selby had previously asked that all analytical data on the samples sent for ICP analyses should be sent only to him at the Savant Labs. As noted earlier in the Minutes,

Greg Guinther had already E-mailed some of the data from his Afton lab. Information from Intertek was also expected in the near future from Intertek.

6. Report draft timing

The Chairman suggested that a draft report be put together with the information presently in hand with the understanding that later data can be added to an augmented report. His concern was that holding up the report until the newly requested data were available would give no time for the Task Group to review the report before the ESCIT meeting. Jim Linden was in favor of this approach and all others in the phone conference were in apparent agreement.

7. Old business

a. Lew Williams: suggestion on placing pertinent information on ASTM TMC site

The Chairman brought back to the Task Group their previous discussion of Lew's suggestion at the second phone conference in which there were questions about the value of doing this in view of their publication in the actions of the parent ESCIT group. At the time, the Chairman, who himself was positive about Lew's suggestion, had agreed to contact Lew and get more information. With Lew present the Chairman asked Lew to speak to the question of the value of having a web site.

Lew thought that this approach would give people easier access to follow the work of the Task Group if it were available in one place specifically dedicated to the Task Group's work. Lew further noted that Chris Engel, Secretary of ESCIT was willing to set up the site. Chris would maintain the site with information sent to him for posting.

The Chairman asked for further input from the Task Group and there were no objections to the idea. The Chairman thanked the Task Group for their mandate and asked Lew to have Chris give him a call.

After a further short review of the application of the web site, it was established that the site was only for the posting of important information such as Minutes, reports, etc. and that E-mail and telephone would still be the primary means of information exchange among the Task Group.

8. New business

The only new business had already been discussed concerning Brad Cosgrove's confidential reception of the full results of Joe Franklin's ICP analyses of the eight fresh oil samples.

9. Next meeting

No further phone conferences were planned as the Task Group felt that the meeting of ESCIT next week served the purpose of the Group. All further communications will be by E-mail and telephone among the Members of the Task Group.

Greg Guinther asked about how the correlation analysis will be handled, since this was the objective of the Task Group. In response, it was observed by the Task Group that the draft Report would allow focusing on this information.

10. Closure

The Chairman thanked those attending the phone conference for their active input and thoughts and called the third phone conference of the Task Group to a close at 4:17 PM.



Appendix 1

Proposed Agenda for August 1 Telephone Conference (Entire meeting to be recorded)

1. Other proposed Agenda items.
2. Acceptance of previous Minutes
3. Discussion of time-extended PEI data sent by E-mail
 - a. General observations – all participants
 - b. Decision on generating 64-hour PEI data
4. Further data on pertinent engine and fleet data
 - a. Jim Linden on JAMA oils
5. Shipments of samples from Savant Labs for phosphorus analyses
 - a. Shipping underway
 - i. Afton (Greg Guinther)
 - ii. Intertek (Joe Franklin)
 - b. Return of information to Savant Labs
6. Report draft timing
7. Old business
 - a. Lew Williams: suggestion on placing pertinent information on ASTM TMC site.
8. New business
9. Next meeting
10. Closure

Members of the ESCIT PEI Task Group:

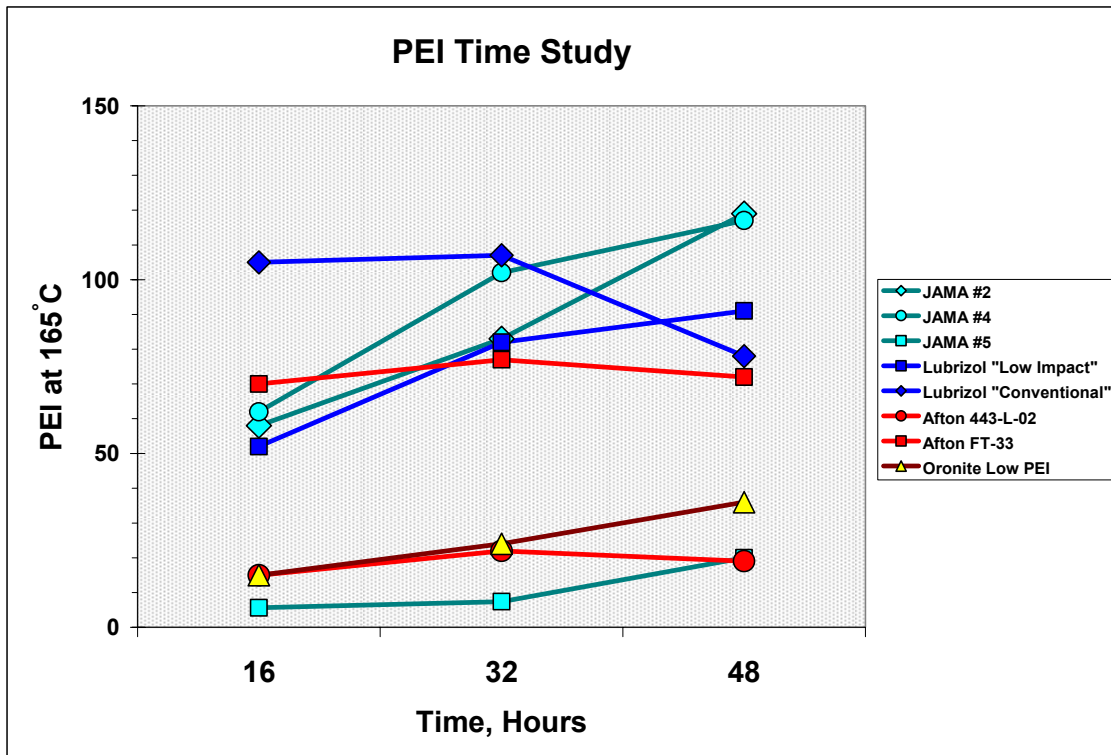
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Task Group Reports to:

Hannah Murray, Chair, ESCIT, Toyota Technical Center
Chris Engel, Secretary, ESCIT, Lubrizol

Appendix 2

ESCIT Extended PEI Testing Matrix						
Oil Source	Oil Code	PEI @ 165°C				
		16 hrs.	24 hrs.	32 hrs.	48 hrs.	64 hrs.
JAMA	Oil 2	58		83	119	
	Oil 4	62		102	117	
	Oil 5	5.6		7.4	20	
Lubrizol	'Low Impact'	52	82		106	
	'Conventional'	105	124		149	
	'Low Impact'			82	91	
	'Conventional'			107	78	
Afton	FT-33	70				
	FT-33			77	72	
	FT-33			73	71	
	RBR-10443-L-02	15				
	RBR-10443-L-02			22	19	
Oronite	Low PEI	15				
	Low PEI			24	36	
Earlier samples						
Values possibly affected by progressive instrument failure						



Appendix 3

