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These are the unapproved minutes of the 11.12.2020 Sequence VI Conference Call.

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The meeting was called to order at 1:04 PM Central Time by Chair Andrew Stevens.

- 1.0 The Agenda is Attachment 1.
- 2.0 Roll Call. Attendance is Attachment 2. There were no member changes.

3.0 Old Business

MOTION: Approve minutes from the 10.29.2020 conference call.  
Andrew, Rich second. Approval was unanimous.

4.0 New Business

4.1 A fuel specification was approved unanimously at the TGC Fuel Specification Task Force. See Attachment 3. There was a lot of discussion of the analysis required, especially aromatics, D5769. Note 4 was added to the specification to allow some range for discussion and comparison in the results.

4.2 A motion was made and a roll call vote taken. The motion passed.

MOTION: ACCEPTANCE OF LUBE CERTIFICATION FUEL SPECIFICATION FROM TGC FUEL TASK FORCE. THE FUEL SPEC WOULD BE REMOVED FROM PROCEDURE AND STORED ON TMC WEB SITE WITH INFO LETTER ANDREW, BEN SECOND  
Y 13 N WAIVE 2 The motion passes.

4.1 During the 09.08 meeting a motion was made to take fuel samples every quarter and tie those results to a VIE reference run in that quarter. This data would be reviewed in relation to the VIE analysis done by Todd Dvorak. Here is that motion:

MOTION: Effective 09.08.2020, labs will take a sample every quarter and tie to the first reference in that quarter. Sample will be taken at fuel rail before starting the reference test. Tests will be run for Net Heating Value [D3338], RVP and Distillation Curve. All samples will be measured at the same lab [Saybolt]. If possible include residence time for the fuel in the tank.

4.1.1 The Saybolt facility in Deer Park Texas was selected. The data will not be related or traceable to any candidate results. There will only be a comparison to a VIE reference for each sample for each lab for each quarter. Should a lab not be running a VIE reference that quarter, a sample is not required.

4.1.2 Some labs have already sent their samples and are running or have completed the reference.

4.1.3 Here are the tests that will be run. These were supplied by Sandra Kaluza. She attended the meeting to answer any possible questions.

- ASTM D3338 Net Heating Value
- ASTM D86 Distillation Curve
- ASTM D5191 Reid Vapor Pressure

“D3338 Net Heating Value is a calculation which also requires me to run  
Gravity ASTM D4052  
Aromatics (FIA) ASTM D1319  
Sulfur ASTM D5453

4.2 Fuel analysis discussion moved to the quantity remaining of the current batch and when the next batch would begin. Prasad had contacted labs on their needs going into 2021.

4.2.1 There are about 35,000 gallons remaining, which would last 3-4 months.

4.2.2 Haltermann is interested in a contract but would only produce about 140,000 gallons for this batch. The contract would be worked through TMC as was done on the current contract. Haltermann plans to start the new build in December or January.

4.2.3 The current batch lasted about two years. There were questions on how many corrections were made.

**ACTION:** Haltermann will supply fuel corrections to be posted on the TMC web site.

4.3 Rich Grundza discussed calibration periods as the industry slows down. Here is the wording of an email sent to the chair:

I'd like to discuss the subject of lapsed calibrations in VIE labs and at what point does a lab need to reset its charts. Also, if lapsed calibrations on all of its stands cause it to be considered a new lab, then does it need to follow the new lab requirements delineated in the LTMS:

1. New Test Laboratory

A new test laboratory will require four operationally valid calibration tests (uninterrupted by non-reference oil tests) on multiple reference oils, in a single stand/engine combination, with at least one reference oil replicated. None of the tests need pass acceptance limits.

The LTMS document also defines that lapsed calibrations in stands require renumbering as a new stand:

The TMC will use engineering judgment regarding the renumbering of test stands on which lapses in calibration periods occur. In such cases, a stand will generally not be renumbered if a calibration test sequence is started (and maintained) within one calibration period from the end of the previous period. However, if a review of the past and present configuration of the stand, tests conducted in between calibration periods (standardized or not), or any other pertinent information dictates,

renumbering will be required. In cases where more than one calibration period has elapsed, generally, renumbering will be required.

I believe some further definition may be needed in those cases where a lab's stand(s) all may have lapsed beyond several calibration periods and what is required to re-establish calibration as a laboratory.

4.3.1 The main consideration is that if a lab has run the test they would not be considered a new lab. This would assist with charting and reference history.

4.3.2 There will be an Information Letter to define the process.

The meeting adjourned at 2:06 PM. There was discussion to attempt to coordinate calendars with other meetings.

**Sequence VI Surveillance Panel Call Meeting Agenda  
November 12, 2020 @ 10:00-11:30 EST**

**1. Roll Call (start 10:05 EST)**

*1.1. SP Membership changes and additions*

**2. Old Business**

2.1	Approve Minutes from 10/29 call	Andrew Stevens
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**3. New Business**

3.1	Discussion/Approval of Fuel Spec	Andrew Stevens
3.2	Logistics of Quarterly Fuel Sampling	Panel

**4. Next Meeting**

*4.1. SP Meeting: TBD*

**5. Meeting Adjourned**

**APPENDIX**

**ASTM SEQUENCE VI**

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**VOTING MEMBERS**

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Paul Rubas			
Jim Carter	APPROVE		
Aleise Gauer	APPROVE		
Prasad Tumati	WAIVE		
Andy Ritchie	APPROVE		
Adrian Alfonso	APPROVE		
Andrew Stevens	APPROVE		
Jason Bowden			
Jeff Hsu	APPROVE		
Dan Worcester	APPROVE		
Dan Lanctot	APPROVE		
Rich Grundza	APPROVE		
Teri Kowalski			
Amol Savant	WAIVE		
	13 yes, 2 waive		

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Haiying Tang			
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Aleise Gauer			
Prasad Tumati			
Andy Ritchie			
Adrian Alfonso			
Andrew Stevens			
Jason Bowden			
Jeff Hsu			
Dan Worcester			
Dan Lanctot			
Rich Grundza			
Teri Kowalski			
Amol Savant			

## Seq. VI Lube Certification Fuel

29-Oct-20

TEST	METHOD	UNITS	Seq. VI Specs				
			MIN	TARGET	MAX		
Distillation - IBP	ASTM D86	°C	23.9		35.0		
5%		°C					
10%		°C				48.9	57.2
20%		°C					
30%		°C					
40%		°C					
50%		°C				93.3	110.0
60%		°C					
70%		°C					
80%		°C					
90%		°C				151.7	162.8
95%	°C						
Distillation - EP		°C			212.8		
Recovery		vol %		Report			
Residue		vol %		Report			
Loss		vol %		Report			
Gravity @ 60°F/60°F	ASTM D4052	°API	58.7		61.2		
Density @ 15° C	ASTM D4052	kg/l	0.734		0.744		
Dry Vapor Pressure Equivalent	ASTM D5191	kPa	60.1		63.4		
Carbon	ASTM D3343	wt %		Report			
Carbon	ASTM D5291	mass %		Report			
Hydrogen	ASTM D5291	mass %		Report			
Hydrogen/Carbon ratio	ASTM D5291	mole/mole		Report			
Oxygen <sup>1</sup>	ASTM D4815	wt %			0.2		
Oxygenates Ethanol	ASTM D4815	%		Report			
MTBE		%		Report			
ETBE		%		Report			
Methanol		%		Report			
Sulfur	ASTM D5453	mg/kg	3		15		
<b>Composition, aromatics</b>	<b>ASTM D5769<sup>4</sup></b>	<b>vol %</b>	<b>31.0</b>		<b>34.0</b>		
<b>C6 aromatics (benzene)</b>	<b>ASTM D5769</b>	<b>vol %</b>			<b>1.00</b>		
<b>C7 aromatics (toluene)</b>	<b>ASTM D5769</b>	<b>vol %</b>		Report			
<b>C8 aromatics</b>	<b>ASTM D5769</b>	<b>vol %</b>		Report			
<b>C9 aromatics</b>	<b>ASTM D5769</b>	<b>vol %</b>		Report			
<b>C10+ aromatics</b>	<b>ASTM D5769</b>	<b>vol %</b>		Report			
<b>Composition, olefins</b>	<b>ASTM D6550<sup>4</sup></b>	<b>wt%</b>			<b>2.0</b>		
Lead <sup>1</sup>	ASTM D3237	mg/l			2.6		
Manganese <sup>1</sup>	ASTM D3831	g/gal			0.01		
Phosphorus <sup>1</sup>	ASTM D3231	mg/l			1.3		
Silicon <sup>1</sup>	ICP method	mg/kg			4		
Particulate matter	ASTM D5452	mg/l			1		
Oxidation Stability	ASTM D525	minutes	1000				
Copper Corrosion	ASTM D130				1		
Gum content, washed	ASTM D381	mg/100mls			5.0		
Gum content, unwashed	ASTM D381	mg/100mls	7.0		20.0		
Research Octane Number	ASTM D2699		96.0				
Motor Octane Number	ASTM D2700			Report			
R+M/2	D2699/2700			Report			
Sensitivity			7.5				
Net Heating Value, btu/lb	ASTM D3338	btu/lb		Report			
Gross Heating Value, btu/lb	ASTM D240	btu/lb		Report			
Net Heating Value, btu/lb	ASTM D240	btu/lb		Report			
Water and Sediment	ASTM D2709	vol%			0.01		
Color <sup>2</sup>	VISUAL	1.75 ptb		Red			
Top Tier Additive <sup>3</sup>	ppm m/m	267		Report			

<sup>1</sup> no intentional addition of these elements<sup>2</sup> Innospec Oil Red B4 Liquid Dye<sup>3</sup> Lubrizol UltraZol 8219. Can be obtained from Lubriol Sales.<sup>4</sup> or use D6839 for everything measured by D5769 and D6550

for any conflict between supplier and customer measurement, refer to ASTM D3244 assigning risk 50/50 between supplier and customer

supplier should choose a lab to perform analysis and refrain from moving samples lab to lab in order to obtain "in spec" results