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COMMITTEE D02 ON PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

Issued: 06.21.2017

Reply to: Dan Worcester
Southwest Research Institute
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These are the unapproved minutes of the 06.20.2017 Sequence VI Conference Call.

The meeting was called to order at 9:05 AM Central Time by Chair Greg Miranda.

Agenda

The Agenda is the included as Attachment 1.

1.0 Roll Call

The Attendance list is Attachment 2. There were no member changes.

1.1.1 Approval of Meeting minutes from 04.26.2017 Seq. VI SP call.

2.0 Approval of Meeting minutes from April 26, 2017 Seq. VI SP meeting

Approve the Surveillance Panel minutes.

2.1 Greg Miranda made the motion and Jason Bowden seconded.

2.2 The minutes received unanimous approval.

3.0 Old Business

3.1 Seq. VIE/F Short Block Hardware Task Force Update Adrian Alfonso

3.1.1 Hardware availability update

14 of the 15 tests scheduled for 3 labs are reported. The 15th test will be called in to TMC the day of this meeting. 20 tests are scheduled. The 4th lab has started the first test in their series. That matrix will complete the end of July. Rich will update the test runs and comments for the data.

Bob Campbell asked if those tests were run on calibrated stands. Rich noted that was not specified, but the stand was calibrated prior to running the matrix.

The industry concern in remaining life of the OHT-2 engines. There are 24 of those left. Labs will provide OHT with their current inventory for re-distribution.

MOTION #1: After confirming that the engines used for the prove out matrix were built using the latest draft of the Sequence VIE/F GM Kit Assembly Manual as well as confirming with TMC that all the reported tests to date shown on the table below are valid and ran within the parameter of the seq. VI procedure; the Sequence VIE/F Engine Rebuild Task Force recommends to the Seq. VI Surveillance Panel to accept these test as operationally valid and accept them for analysis. The data from the fourth lab will be included at a later time once the 5th of 5 tests are completed.

Adrian Alphonso, Second: Katerina Pecinovsky Result: 13 Y, 0 N, 1 W

3.1.2 Status of short block hardware introduction Matrix

See Attachment 3 for the matrix results to date.

There was a lot of discussion on whether to wait for the 20 test matrix or to begin analysis with 15 completed tests. Two labs will be low on engines by the end of July. The concern is Stat analysis needs to consider engine hour corrections, and possible adjustment of reference oil targets. There will be a meeting the second week in July [Tuesday July 11 at the same time as the current meeting] for preliminary review of the analysis done to that point.

3.2 Update on BL5 Introduction (Presentation Included) Rich Grundza

3.2.1 **Motion forthcoming:** unanimous consent to approve VIEBL5 for use in Sequence VIE/F testing

Data was from IAR and SwRI each running a 12 stage matrix on BL2 and BL5. This was the 6 stages of BLB. There was discussion on how a lab will convert to BL5. Initial discussion was a single reference in a new engine and allow the generated severity adjustments to correct for differences. This would be lab level approval. An engine calibrated on BL5 would run its calibration period on the same baseline oil. See Attachment 4 for BL5 update.

MOTION #2: Approve BL5 for use once an acceptable reference has been obtained in a stand.

Rich Grundza, Second: Adrian Alphonso Result: 12 Y, 0 N, 2 W

3.3 Seq. VID-VIF Equivalency Update

3.3.1 Recap from last meeting

CLOG was asked to review test options, including running either or both oils 200 and 300.

3.3.2 Options presented to CLOG

Intertek and SwRI would provide calibrated test stands for the oils to be selected and the number of runs determined.

3.3.3 CLOG recommendation

The recommendation was two runs on oil 300 at each test lab.

3.3.4 Status on Equivalency Work

IAR is running the second VIF references oil and will be ready to start the matrix June 26th. SwRI is running the first VIF reference oil and would be ready to start 07.05.2017. Results would be ready for review the last week in July. TMC will create CMIR numbers for the oils so they can be reported. The oils are due to arrive at the labs the week of June 20th. Both labs agreed to check and report the arrival.

4.0 New Business

4.1 Reference Oil Status

TMC is down to 18 gallons of 542-2 reference oil. Test labs will need to move to 542-3. Charlie requested labs run 542-2 on OHT-2 engines and BL-4. Rich noted this new blend would not be used on the API or Toyota matrix work.

5.0 Next Meeting

5.1 The next SP meeting is planned July 11, 2017 at 10:00 Eastern Time.

The meeting adjourned at 10:28 AM.

Sequence VI Surveillance Panel Conference Call Agenda
June 20, 2017 @ 10:00-11:30 EST

Audio Connection

Call-in Number: +1-415-655-0001
Conference Code: 192 350 647

Webex Meeting URL:

https://meetings.webex.com/collabs/#/meetings/detail?uuid=MAI29QHMA1GPY981R0MICY6RLN-20XT&rnd=544346.71013

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

   1.1. SP Membership changes and additions

2. **Approval of Meeting minutes from April 26, 2017 Seq. VI SP meeting**

3. **Old Business**

3.1	Seq. VIE/F Short Block Hardware Task Force Update 3.1.1 Hardware availability update 3.1.2 Status of Short block hardware introduction Matrix	Adrian Alfonso
3.2	Update on BL5 Introduction (Presentation Included) 3.2.1 **Motion forthcoming:** unanimous consent to approve VIEBL5 for use in Sequence VIE/F testing	Rich Grundza
3.3	Seq. VID-VIF Equivalency Update 3.3.1 Recap from last meeting 3.3.2 Options presented to CLOG 3.3.3 CLOG recommendation 3.3.4 Status on Equivalency Work	Greg Miranda

4. **New Business??**

5. **Next Meeting**

   5.1. TBD

6. **Meeting Adjourned**

ASTM SEQUENCE VI

Name	Email/Phone	Company	Attend
Adrian Alfonso **Voting Member**	Phone: (210) 838-0431 Adrian.Alfonso@intertek.com	Intertek	ATTEND
Jason Bowden **Voting Member**	Phone: (440) 354-7007 jhbowden@ohtech.com	OHT	ATTEND
Amol Savant **Voting Member**	acsavant@valvoline.com	Valvoline	ATTEND
Tim Cushing **Voting Member**	Phone: (248) 881-3518 Timothy.Cushing@gm.com	General Motors	ATTEND
Rich Grundza **Voting Member**	Phone: (412) 365-1034 reg@astmtmc.cmu.edu	TMC	ATTEND
Jeff Hsu **Voting Member**	Phone: (832) 419-3482 j.hsu@shell.com	Shell	ATTEND
Teri Kowalski **Voting Member**	Phone: (734) 995-4032 Teri.Kowalski@tema.toyota.com	Toyota	ATTEND
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Greg Miranda **Voting Member**	Phone: (440) 347-8516 Greg.Miranda@Lubrizol.com	Lubrizol	ATTEND
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Brianne Pentz **Voting Member**	Phone: Brianne.Pentz@bp.com	BP	
Andy Ritchie **Voting Member**	Phone: (908) 474-2097 Andrew.Ritchie@infineum.com	Infineum	ATTEND
Ron Romano **Voting Member**	Phone: (313) 845-4068 rromano@ford.com	Ford	
Clifford Salvesen **Voting Member**	Phone: (856) 224-2954 Clifford.r.Salvesen@exxonmobil.com	ExxonMobil	ATTEND
Kaustav Sinha **Voting Member**	Phone: (713) 432-6642 LFNQ@chevron.com	Chevron Oronite	
Haiying Tang **Voting Member**	Phone: (248) 512-0593 HT146@Chrysler.com	Chrysler	
Dan Worcester **Voting Member**	Phone: (210) 522-2405 Dan.Worcester@swri.org	SwRI	ATTEND

ASTM SEQUENCE VI

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Hap Thompson	Hapjthom@aol.com	VIx Facilitator	
Chris Taylor	Chris.Taylor@vpracingfuels.com	VP Racing Fuels	

ASTM SEQUENCE VI

Name	Email/Phone	Company	Attend

MOTION:	**KIT MATRIX**	**BL5**		
Adrian Alfonso **Voting Member**	APPROVE	APPROVE		
Jason Bowden **Voting Member**	APPROVE	WAIVE		
Amol Savant **Voting Member**	APPROVE	APPROVE		
Tim Cushing **Voting Member**	APPROVE	APPROVE		
Rich Grundza **Voting Member**	APPROVE	APPROVE		
Jeff Hsu **Voting Member**	APPROVE	APPROVE		
Teri Kowalski **Voting Member**	APPROVE	APPROVE		
Dan Lanctot **Voting Member**	WAIVE	WAIVE		
Greg Miranda **Voting Member**	APPROVE	APPROVE		
Katerina Pecinovsky **Voting Member**	APPROVE	APPROVE		
Brianne Pentz **Voting Member**				
Andy Ritchie **Voting Member**	APPROVE	APPROVE		
Ron Romano **Voting Member**				
Clifford Salvesen **Voting Member**	APPROVE	APPROVE		
Jo Martinez for **Voting Member**	APPROVE	APPROVE		
Haiying Tang **Voting Member**				
Dan Worcester **Voting Member**	APPROVE	APPROVE		
VOTES	13 Y, 0 N, 1 W	12 Y, 0 N, 2 W		

ASTM SEQUENCE VI

Name	Email/Phone	Company	Attend

MOTION:				
Adrian Alfonso **Voting Member**				
Jason Bowden **Voting Member**				
Amol Savant **Voting Member**				
Tim Cushing **Voting Member**				
Rich Grundza **Voting Member**				
Jeff Hsu **Voting Member**				
Teri Kowalski **Voting Member**				
Dan Lanctot **Voting Member**				
Greg Miranda **Voting Member**				
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Brianne Pentz **Voting Member**				
Andy Ritchie **Voting Member**				
Ron Romano **Voting Member**				
Clifford Salvesen **Voting Member**				
Kaustav Sinha **Voting Member**				
Haiying Tang **Voting Member**				
Dan Worcester **Voting Member**				
VOTES				

ASTM SEQUENCE VI

Name	Email/Phone	Company	Attend

MOTION:				
Adrian Alfonso **Voting Member**				
Jason Bowden **Voting Member**				
Amol Savant **Voting Member**				
Tim Cushing **Voting Member**				
Rich Grundza **Voting Member**				
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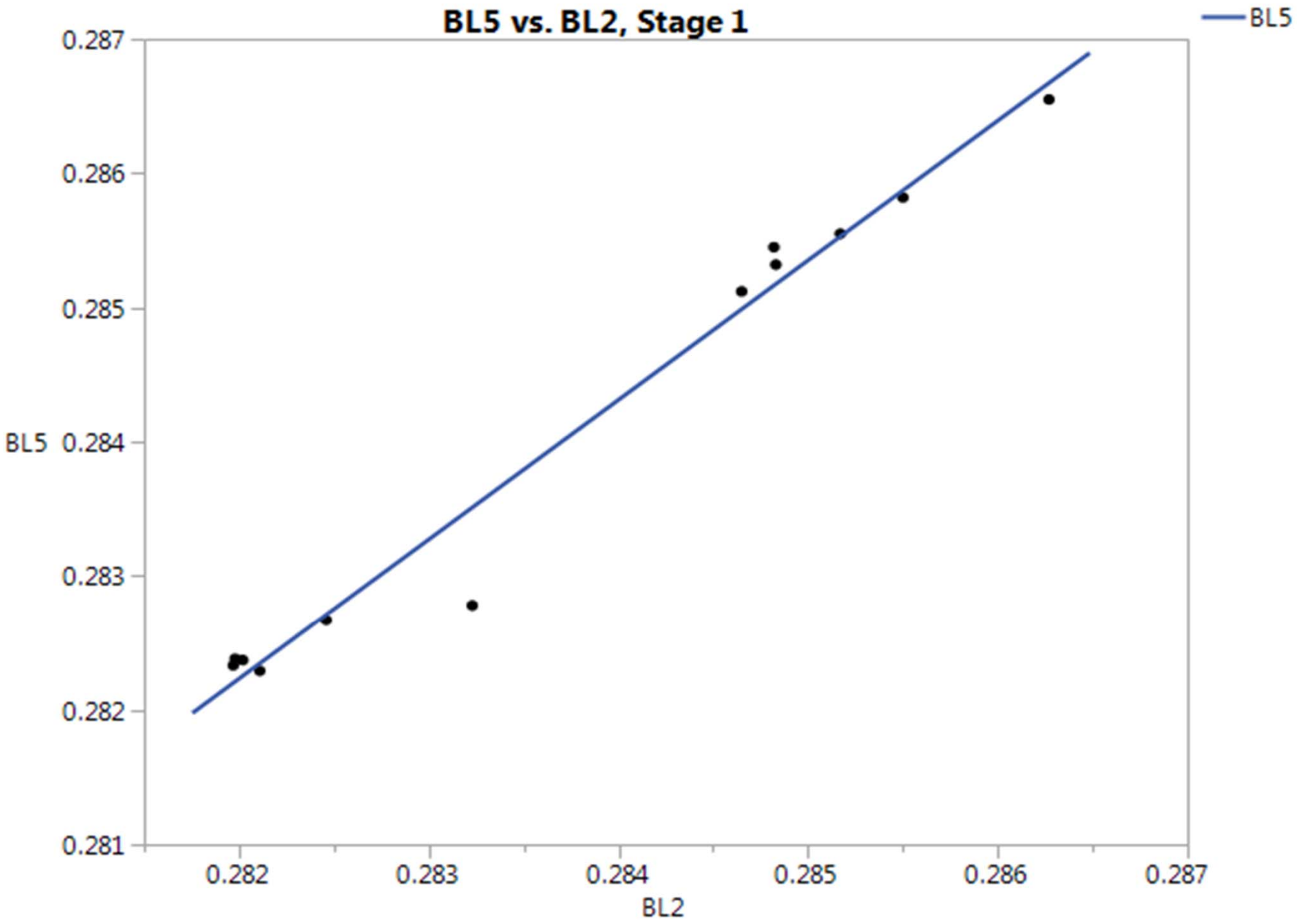
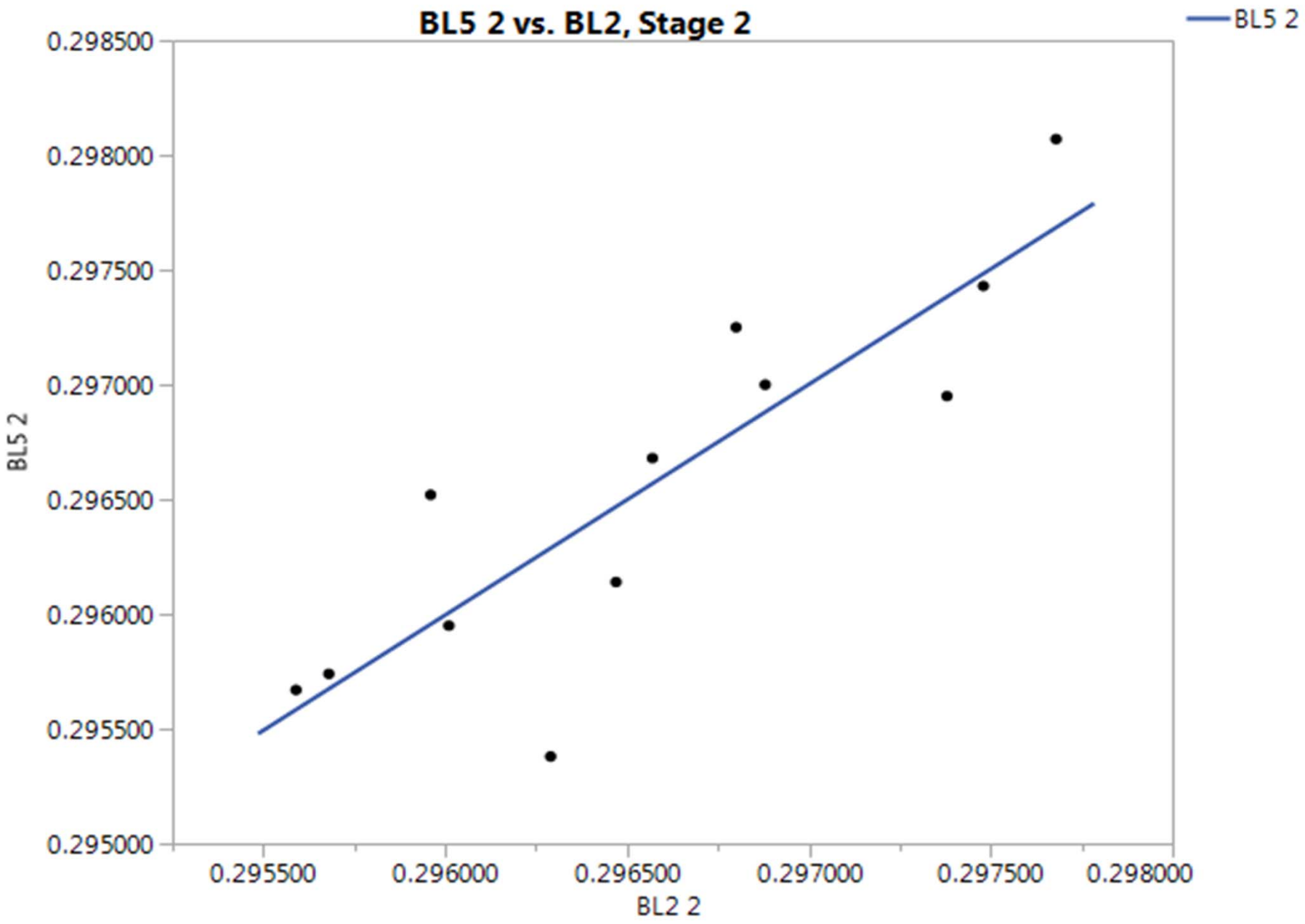
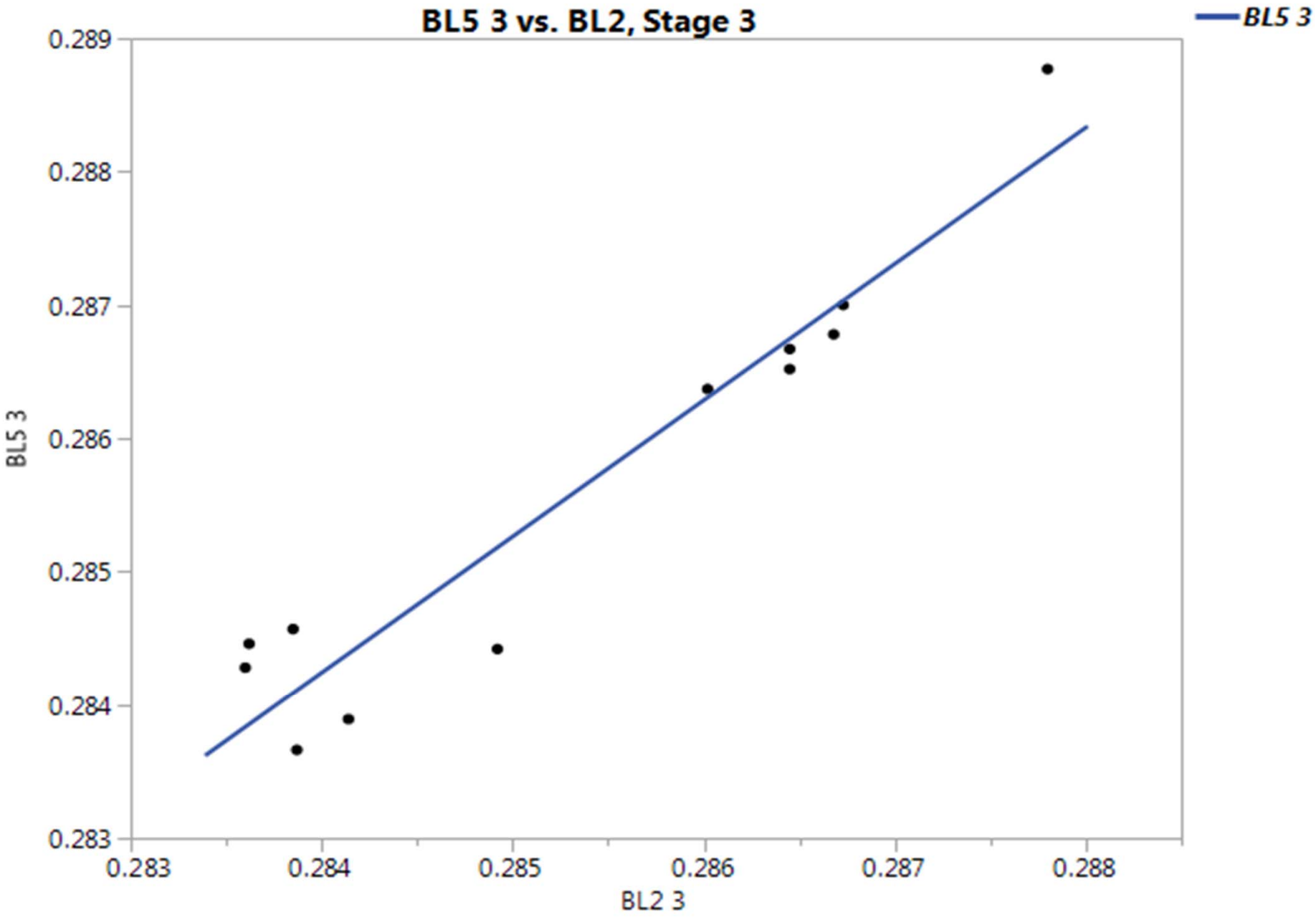
Ron Romano **Voting Member**				
Clifford Salvesen **Voting Member**				
Kaustav Sinha **Voting Member**				
Haiying Tang **Voting Member**				
Dan Worcester **Voting Member**				
VOTES				

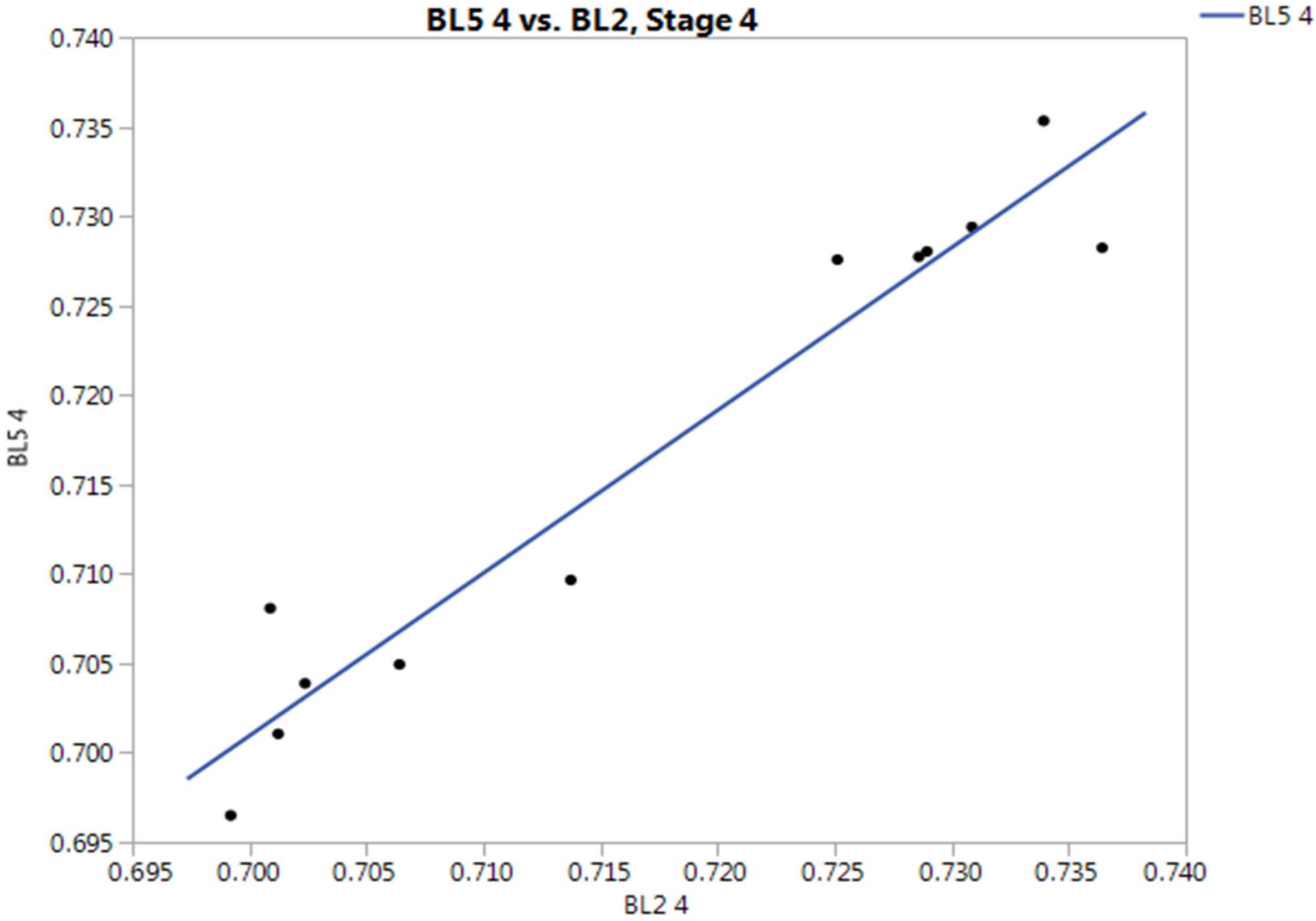
TESTKEY	APP	LAB	IND	ENGNO	RUN	VAL	FEI1	FEI1_OR	FEI1yi	FEI2	FEI2_OR	FEISUM	FEI2yi	COM1	COM2	LTMSDATE	ENHR	TOTOCON
124414-VIE	2	G	542-2	100C	1	AI	2.34	2.51	-0.7097	1.47	1.59	3.81	-0.8667	1ST OF 5	GM BUILD	20170419	350	800
125284-VIE	2	G	544	100C	2	AI	1.24	1.31	-0.2308	1.6	1.65	2.84	0.95	2ND OF 5	GM BUILD	20170428	548	1100
126026-VIE	2	G	544	100C	3	AI	1.29	1.25	-0.0385	1.35	1.32	2.64	-0.3	3RD OF 5	GM BUILD	20170509	746	1200
124408-VIE	2	G	1010-1	100C	4	AI	1.61	1.47	-1.0741	1.59	1.49	3.2	-0.92	4th OF 5	GM BUILD	20170518	944	1200
126023-VIE	2	G	542-2	100C	5	AI	2.27	2.03	-0.9355	1.45	1.27	3.72	-0.9333	5th OF 5	GM BUILD	20170527	1143	1000
124421-VIE	2	A	544	101A	1	AI	0.92	1.08	-1.4615	1.08	1.19	2	-1.65	1ST OF 5	GM BUILD	20170428	370	600
123339-VIE	2	A	1010-1	101A	2	AI	1.44	1.49	-1.7037	1.47	1.51	2.91	-1.4	2ND OF 5	GM BUILD	20170509	572	700
124419-VIE	2	A	542-2	101A	3	AI	2.33	2.28	-0.7419355	1.6	1.56	3.93	-0.43333	3RD OF 5	GM BUILD	20170519	773	800
126013-VIE	2	A	542-2	101A	4A	AG	2.57	2.37	0.0323	1.27	1.12	3.84	-1.53333	4th OF 5	GM BUILD	20170607	1061	1400
122936-VIE	3	D	1010-1	001G	1	AI	1.58	1.74	-1.1852	1.29	1.41	2.87	-2.12	1ST OF 5	GM BUILD	20170506	366	100
125285-VIE	3	D	542-2	001G	2	AI	2.37	2.42	-0.6129	1.38	1.42	3.75	-1.1667	2ND OF 5	GM BUILD	20170518	570	400
120619-VIE	3	D	544	001G	3	AI	1.26	1.21	-0.1538462	1.02	0.98	2.28	-1.95	3RD OF 5	GM BUILD	20170527	776	600
126020-VIE	3	D	544	001G	4	AI	1.3	1.14	0	1.06	0.94	2.24	-1.75	4th OF 5	GM BUILD	20170605	978	800

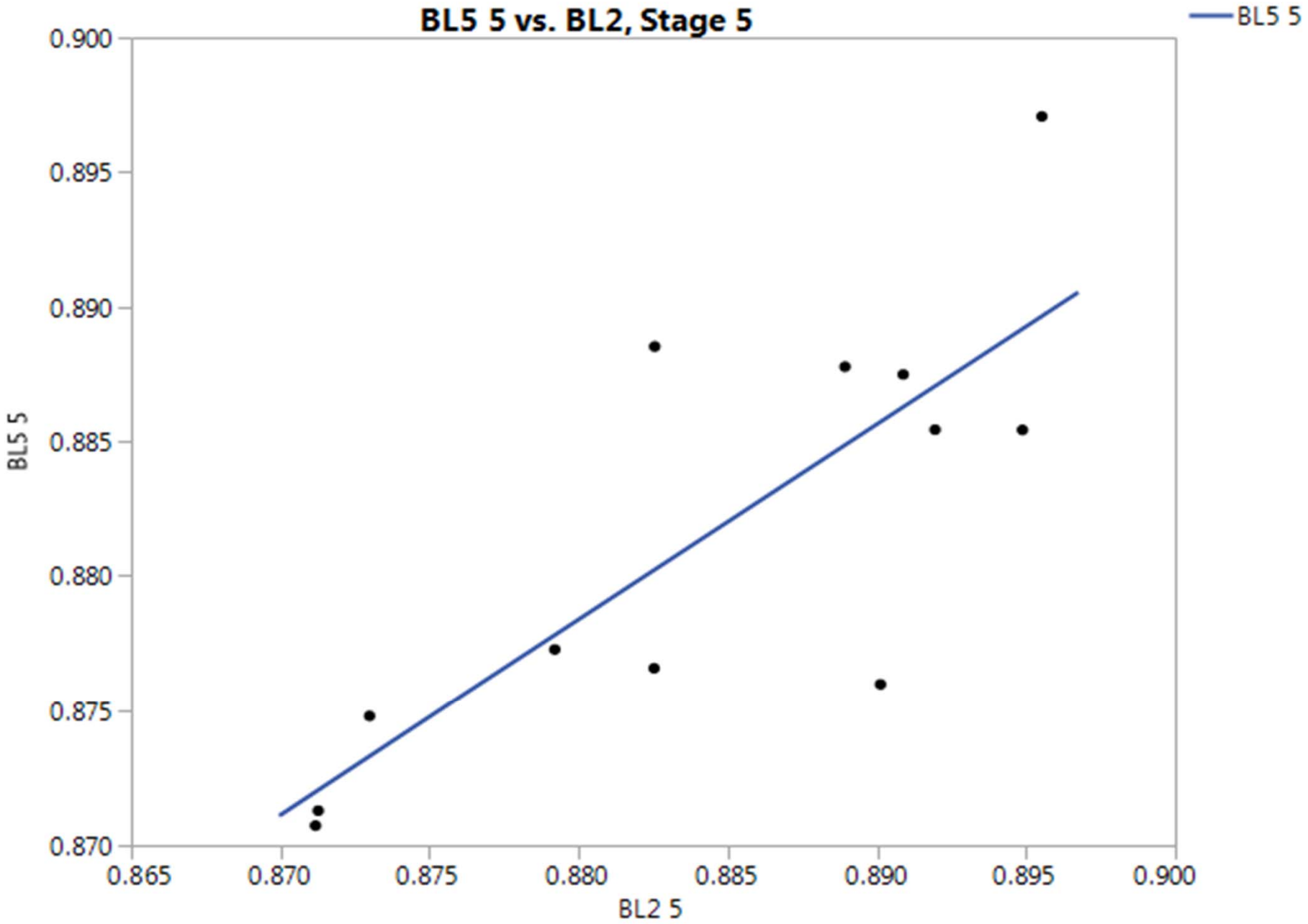
BL-5 Approval Results

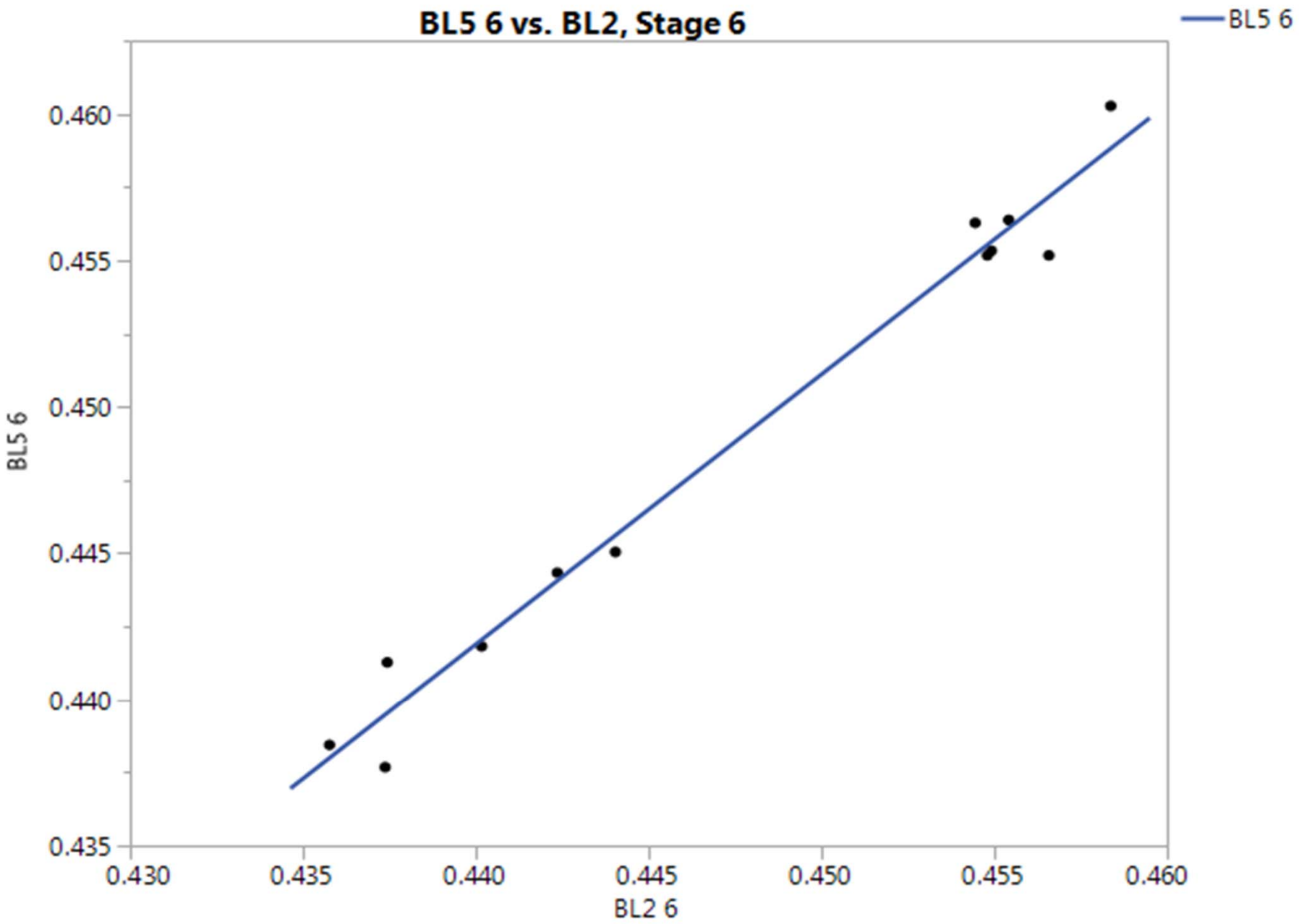












TMC Analysis

- TMC estimated the average difference between BL-2 and BL-5 (BL-2 minus BL-5) as -0.0051 for Total fuel consumed, while weighted fuel consumed showed a difference of -0.0019. Results of stage data are at the end of the presentation in Appendix 1.
- Historical results are summarized for both BC (VIB) and BL (VID/VIE) on next slide.

TMC Analysis (cont.)

BC/BL Blend Comparison	Difference
BC-2 versus BC-3 (BC-2 minus BC-3)	-0.0003
BC-2 versus BC-4 (BC-2 minus BC-4)	+0.0003
BC-2 versus BC-5 (BC-2 minus BC-5)	-0.0005
BC-2 versus BC-6 (BC-2 minus BC-6)	-0.0004
BL-2 versus BL-3 (BL-2 minus BL-3)	-0.0028
BL-2 versus BL-4 (BL-2 minus BL-4)	-0.0027
BL-2 versus BL-5 (BL-2 minus BL-5)	-0.0051

Conclusions

- BL5 blend less fuel efficient than BL-2.
- Average difference between BL-2 and BL-5, in terms of total fuel consumed is -0.0051 kg or 5.1 grams of fuel.
- In terms of Weighted fuel consumed, -0.0019 kg or 1.9 grams of fuel.

Appendix 1
Summary of Results

					SEQUENCE VIE BL5 VERIFICATION DATA							
		Stage 1 BSFC DATA				Stage 2 BSFC DATA				Stage 3 BSFC DATA		
Lab		BL2	BL5	BL2-BL5		BL2	BL5	BL2-BL5		BL2	BL5	BL2-BL5
G		0.28323	0.28278	0.00045		0.29629	0.29538	0.00091		0.28492	0.28442	0.00050
G		0.28198	0.28238	-0.00040		0.29559	0.29567	-0.00008		0.28362	0.28446	-0.00084
G		0.28197	0.28233	-0.00036		0.29568	0.29574	-0.00006		0.28414	0.28389	0.00025
G		0.28202	0.28237	-0.00035		0.29601	0.29595	0.00006		0.28387	0.28366	0.00021
G		0.28246	0.28267	-0.00021		0.29647	0.29614	0.00033		0.28360	0.28428	-0.00068
G		0.28211	0.28229	-0.00018		0.29596	0.29652	-0.00056		0.28385	0.28457	-0.00072
A		0.28627	0.28655	-0.00028		0.29768	0.29807	-0.00039		0.28780	0.28877	-0.00097
A		0.28482	0.28545	-0.00063		0.29680	0.29725	-0.00045		0.28673	0.28700	-0.00027
A		0.28465	0.28512	-0.00047		0.29657	0.29668	-0.00011		0.28668	0.28678	-0.00010
A		0.28517	0.28555	-0.00038		0.29688	0.29700	-0.00012		0.28602	0.28637	-0.00035
A		0.28483	0.28532	-0.00049		0.29738	0.29695	0.00043		0.28645	0.28667	-0.00022
A		0.28550	0.28582	-0.00032		0.29748	0.29743	0.00005		0.28645	0.28652	-0.00007
				-0.00030				0.00000				-0.00027
				0.00027				0.00041				0.00046

Appendix 1 (continued)
Summary of Results

					SEQUENCE VIE BL5 VERIFICATION DATA							
	Stage 4 BSFC DATA					Stage 5 BSFC DATA				Stage 6 BSFC DATA		
Lab	BL2	BL5	BL2-BL5		BL2	BL5	BL2-BL5		BL2	BL5	BL2-BL5	
G	0.71373	0.70966	0.00407		0.88253	0.87656	0.00597		0.44404	0.44505	-0.00101	
G	0.70641	0.70494	0.00147		0.87920	0.87726	0.00194		0.44236	0.44434	-0.00198	
G	0.70089	0.70808	-0.00719		0.89012	0.87596	0.01416		0.44017	0.44183	-0.00166	
G	0.70238	0.70388	-0.00150		0.87299	0.87477	-0.00178		0.43744	0.44128	-0.00384	
G	0.70123	0.70106	0.00017		0.87127	0.87128	-0.00001		0.43738	0.43768	-0.00030	
G	0.69920	0.69650	0.00270		0.87118	0.87073	0.00045		0.43577	0.43844	-0.00267	
A	0.73393	0.73533	-0.00140		0.89553	0.89707	-0.00154		0.45837	0.46027	-0.00190	
A	0.72860	0.72773	0.00087		0.89488	0.88542	0.00946		0.45658	0.45517	0.00141	
A	0.72512	0.72757	-0.00245		0.88255	0.88852	-0.00597		0.45480	0.45517	-0.00037	
A	0.72895	0.72803	0.00092		0.89195	0.88543	0.00652		0.45542	0.45638	-0.00096	
A	0.73087	0.72940	0.00147		0.88893	0.88777	0.00116		0.45445	0.45628	-0.00183	
A	0.73643	0.72823	0.00820		0.89088	0.88748	0.00340		0.45492	0.45533	-0.00041	
			0.00061				0.00281				-0.00129	
			0.00375				0.00549				0.00134	

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