

ISB ICF Review

Statistics Group

July 23, 2025

Statistics Group

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- Seth Demel, Shell
- Todd Dvorak, Infineum
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- Amy Ross, Valvoline
- Phil Scinto, Lubrizol
- Amanda Stone, Afton/New Market

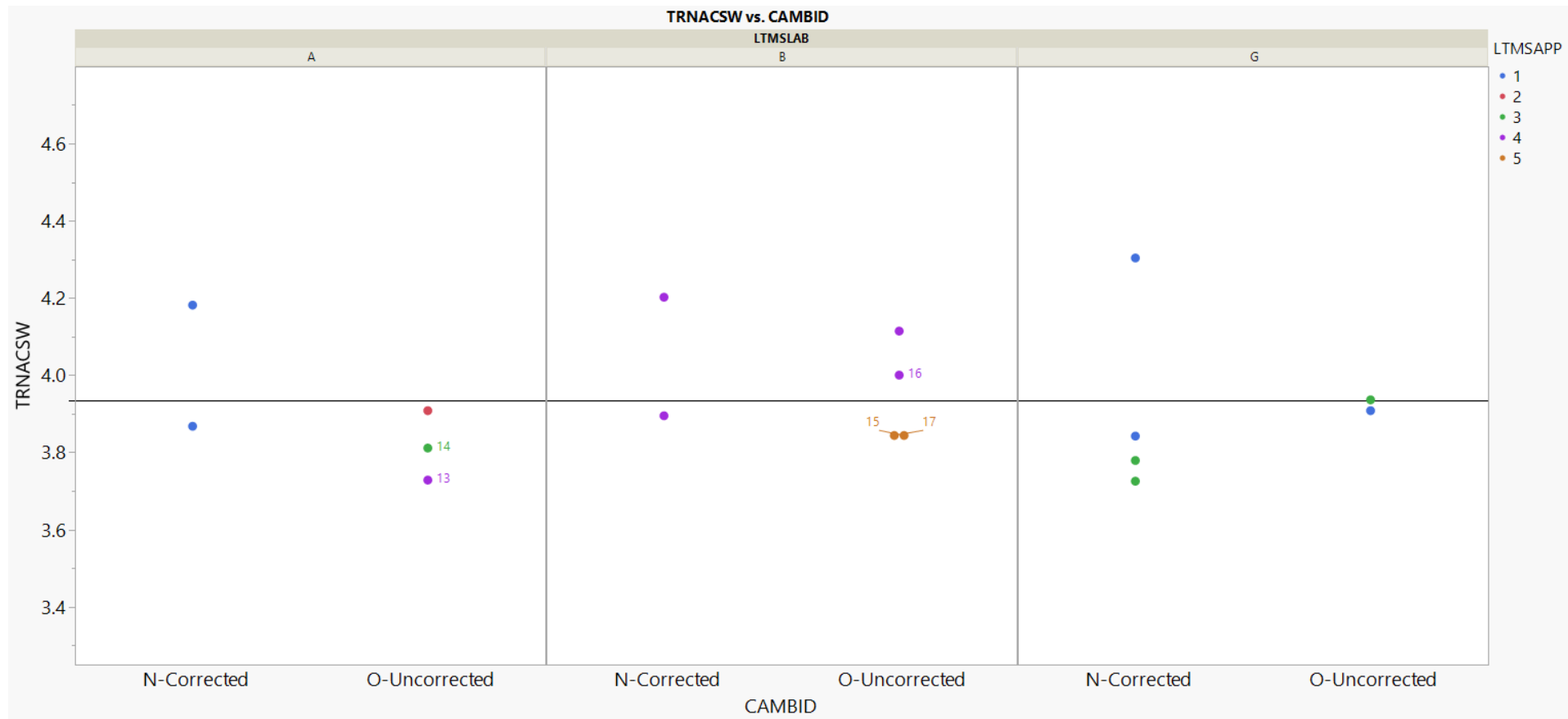
Summary

- SP approved the ICF for ISB hardware HGO in April 2025 and agreed to review once 4 more tests are completed
- There are 5 new tests available to date from 2 out of 3 labs
- Current and updated ICFs are below

Batch ID HGO	Current (n=4)	Updated (n=9 or 7)	
		All Data	Excluding B5
ACSW	None	None	None
ATWL	+1.3147	+1.2484	+1.1153

LnACSW (RO 835 only)

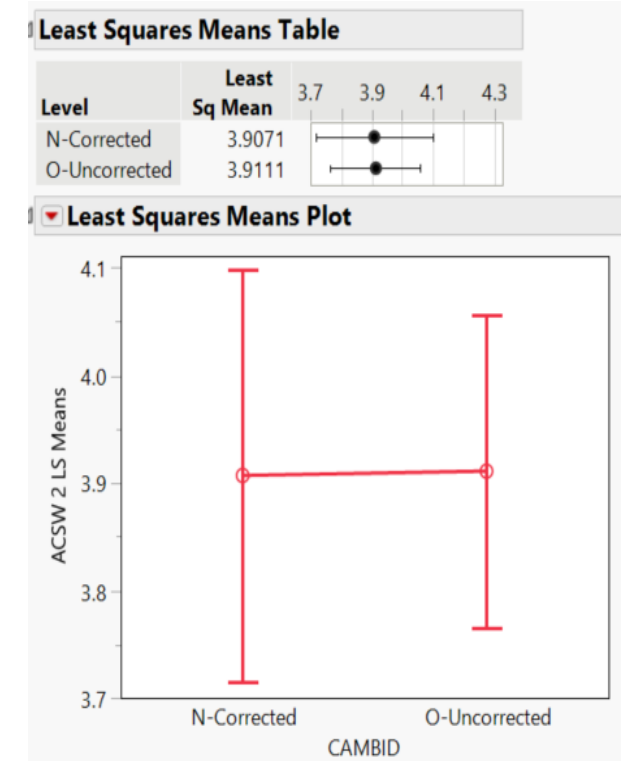
- new tests are labeled 13 to 17



LnACSW model

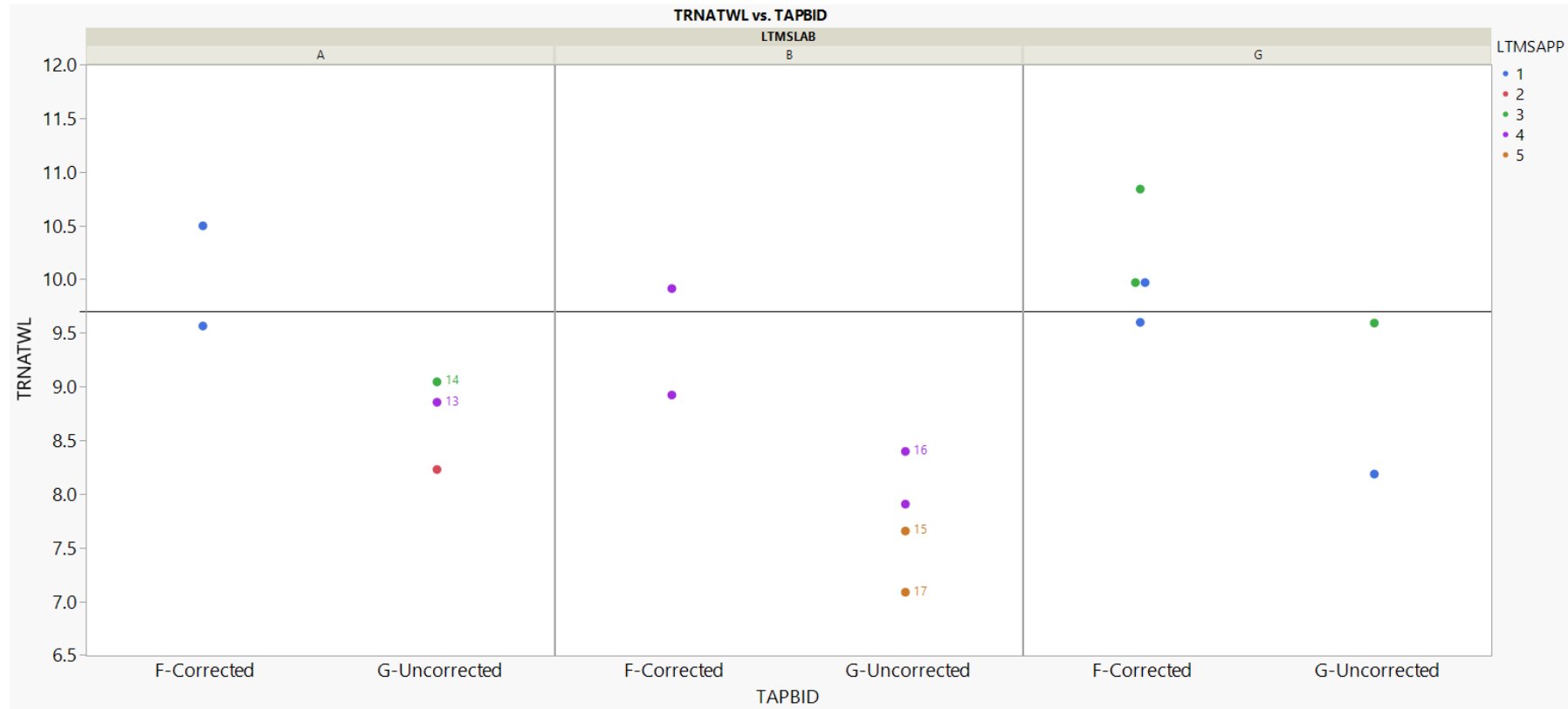
- No significant difference between corrected N and uncorrected O Cam batches
- Predicted LnACSW for CAMID O = 3.9111
- 835 Target = 3.9338
- Difference = +0.0227
- Current ICF = None

Summary of Fit					
RSquare		0.466569			
RSquare Adj		-0.06686			
Root Mean Square Error		0.175844			
Mean of Response		3.933524			
Observations (or Sum Wgts)		17			
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Ratio	
Model	8	0.21636285	0.027045	0.8747	
Error	8	0.24736886	0.030921	Prob > F	
C. Total	16	0.46373171		0.5728	
Parameter Estimates					
Term	Estimate	Std Error	t Ratio	Prob> t	
Intercept	3.9091292	0.046173	84.66	<.0001*	
LTMSLAB[A]	-0.042192	0.066923	-0.63	0.5460	
LTMSLAB[B]	0.0380208	0.064471	0.59	0.5716	
LTMSLAB[A]:LTMSAPP[1]	0.1596125	0.14815	1.08	0.3127	
LTMSLAB[A]:LTMSAPP[2]	0.0390625	0.151831	0.26	0.8035	
LTMSLAB[A]:LTMSAPP[3]	-0.057837	0.151831	-0.38	0.7132	
LTMSLAB[B]:LTMSAPP[4]	0.10545	0.0814	1.30	0.2313	
LTMSLAB[G]:LTMSAPP[1]	0.1052333	0.071788	1.47	0.1808	
CAMBID[N-Corrected]	-0.002	0.057558	-0.03	0.9731	
Effect Tests					
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
LTMSLAB	2	2	0.01586705	0.2566	0.7798
LTMSAPP[LTMSLAB]	5	5	0.15576097	1.0075	0.4713
CAMBID	1	1	0.00003733	0.0012	0.9731



SqrtATWL (RO 835 only)

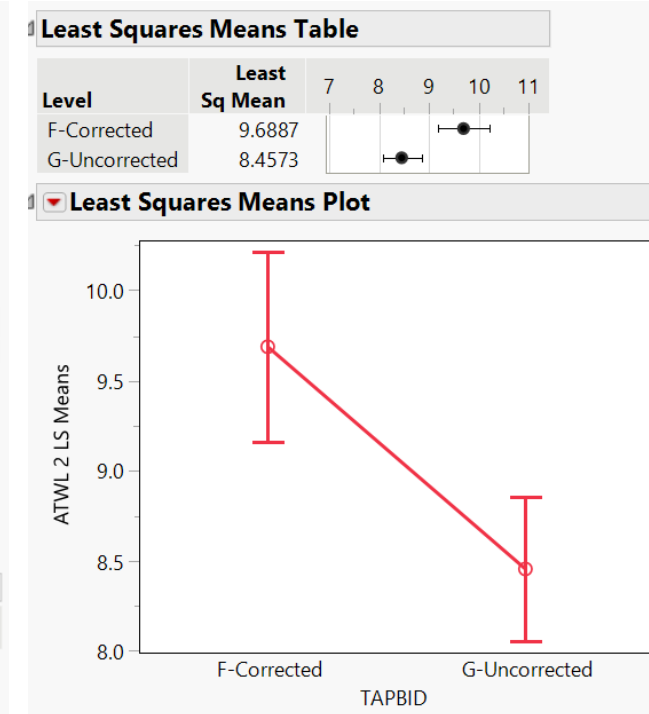
- new tests are labeled 13 to 17
- B5 is a new stand without prior history



SqrtATWL model

- Significant difference between corrected F and uncorrected G Tappet batches
- Predicted SqrtATWL for TAPBID G = 8.4573
- 835 Target = 9.7057
- Difference = +1.2484
- Current ICF = +1.3147

Summary of Fit					
RSquare		0.894518			
RSquare Adj		0.789036			
Root Mean Square Error		0.481734			
Mean of Response		9.071629			
Observations (or Sum Wgts)		17			
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Ratio	
Model	8	15.744004	1.96800	8.4803	
Error	8	1.856541	0.23207		Prob > F
C. Total	16	17.600545			0.0033*
Parameter Estimates					
Term	Estimate	Std Error	t Ratio	Prob> t	
Intercept	9.0730226	0.126494	71.73	<.0001*	
LTMSLAB[A]	0.2742095	0.183338	1.50	0.1731	
LTMSLAB[B]	-0.687965	0.176623	-3.90	0.0046*	
LTMSLAB[A]:LTMSAPP[1]	0.0678536	0.405865	0.17	0.8714	
LTMSLAB[A]:LTMSAPP[2]	-0.503518	0.41595	-1.21	0.2606	
LTMSLAB[A]:LTMSAPP[3]	0.3127821	0.41595	0.75	0.4736	
LTMSLAB[B]:LTMSAPP[4]	0.3991929	0.222999	1.79	0.1112	
LTMSLAB[G]:LTMSAPP[1]	-0.442783	0.196667	-2.25	0.0544	
TAPBID[F-Corrected]	0.6157143	0.157684	3.90	0.0045*	
Effect Tests					
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
LTMSLAB	2	2	3.5433172	7.6342	0.0140*
LTMSAPP[LTMSLAB]	5	5	2.2947822	1.9777	0.1867
TAPBID	1	1	3.5383048	15.2469	0.0045*



SqrtATWL model *excluding stand B5*

- Significant difference between corrected F and uncorrected G Tappet batches
- Predicted SqrtATWL for TAPBID G = 8.5904
- 835 Target = 9.7057
- Difference = +1.1153
- Current ICF = +1.3147

Summary of Fit					
RSquare			0.844232		
RSquare Adj			0.688463		
Root Mean Square Error			0.491956		
Mean of Response			9.298493		
Observations (or Sum Wgts)			15		
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Ratio	
Model	7	9.181931	1.31170	5.4198	
Error	7	1.694148	0.24202		Prob > F
C. Total	14	10.876079			0.0202*
Parameter Estimates					
Term	Estimate	Std Error	t Ratio	Prob> t	
Intercept	9.2060869	0.131024	70.26	<.0001*	
LTMSLAB[A]	0.1411452	0.199641	0.71	0.5024	
LTMSLAB[B]	-0.421837	0.193224	-2.18	0.0653	
LTMSLAB[A]:LTMSAPP[1]	0.0678536	0.414478	0.16	0.8746	
LTMSLAB[A]:LTMSAPP[2]	-0.503518	0.424777	-1.19	0.2745	
LTMSLAB[A]:LTMSAPP[3]	0.3127821	0.424777	0.74	0.4855	
LTMSLAB[G]:LTMSAPP[1]	-0.442783	0.20084	-2.20	0.0633	
TAPBID[F-Corrected]	0.6157143	0.161031	3.82	0.0065*	
Effect Tests					
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
LTMSLAB	2	2	1.2416224	2.5651	0.1460
LTMSAPP[LTMSLAB]	4	4	1.5477570	1.5988	0.2755
TAPBID	1	1	3.5383048	14.6198	0.0065*

