Sequence III Surveillance Panel Meeting Minutes
August 17, 2016
11:00 – 12:30 EDT

1.0) **Attendance**
The attendance is shown in **Attachment 1.**
A copy of the agenda is included as **Attachment 2**

2.0) **Approval of minutes**
The minutes of May 26, 20 16 were approved without objection.

3.0) **Action Item Review**
3.1) Review changes implemented to Sequence IIIG LTMS on March 09, 2016.

A motion was made to amend the LTMS document for IIIG to allow for continuous severity adjustments for all three parameters, PVIS, WPD and ACLW. Motion, Ed Altman, second Robert Stockwell. Effective two weeks from today (3/23/16). Motion was approved 13-0-3. An action item was assigned to review the implementation in 4 months.

No comments from panel members, TMC indicated they had no criteria to evaluate and no labs had indicated any problems with severity adjustments. The panel agreed to evaluate as needed.

4.0) Old Business

4.1) Sequence IIIF/IIIG Rocker Arm situation.
OHT indicated they have about a year supply of rocker arms. The chair agreed to survey the three labs still running the test (SwRI, IAR and Lubrizol) to determine remaining # of runs and report back to the panel.

5.0) New Business

5.1) Revision of Sequence IIIHA & IIIHB LTMS to make parameters report and severity adjust only. Eballot issued July 13 with closing date of July 22. Received one negative.
Ron Romano indicated that this item was discussed at AOAP and that he believed if it is a pass fail parameter, then it should be subject to meeting calibration criteria. Several panel members agreed with Ron and a motion was made by Ron and seconded by Gordon Farnsworth, to table this item for six months, at which time it will be reviewed again to see if it is still appropriate. Motion was made by Ron and seconded by Gordon and was unanimous (14-0-0).

5.2) Review severity of Sequence IIIH, IIIHA & IIIHB. Rich Grundza indicated that industry charts are available at the TMC website. PVIS and MRV are both trending mild. WPD is also trending mild but may have been heavily influenced by a recent result 3.9 standard deviations from target. PHOS is on or near target. Rich also indicate all the recent results have been from new stands, and that there were stand differences noted in the precision matrix, which caused the panel to adopt a stand based LTMS. This will be reviewed again as the original matrix stands begin to recalibrate.

5.3) Consider adjusting the number of decimal places for MRV reporting.
Addison Schweitzer gave a presentation (attachment 3) on the impact of increasing the decimal places used in the severity adjustment process. Addison's presentation indicated that 5 to 6 decimal places provided the least amount of variability in the severity adjustments applied to various candidate results. Discussions indicated that the latest version of the IIIA forms contain 6 decimal places. Rich agreed to verify the number of decimal places and issue a data dictionary change to address this and he would ensure that Test Confirmation Sheet (TCR) would reflect the correct decimal places. A motion was made by Gordon and seconded by Amol Savant to review the

precision of the MRV SA parameter and increase to 5 decimal places, if not at 5 decimal places or larger and to address the TCR accuracy as well, to be completed within one month. The motion was approved unanimously (12-0-0).

5.4) July 28, 2016 version of Sequence IIIH procedure is available at the ASTM-TMC web site. ftp://ftp.astmtmc.cmu.edu/docs/gas/ChryslerIIIH/procedure_and_ils/DRAFT_IIIH_Procedure_July%2028%202016.pdf

Karin Haumann updated the panel on the status of the IIIH procedure. The procedure is in its final form and is ready for Subcommittee B ballot. Karin asked that pane members and other interested users review the procedure and identify any items that may need to be addressed by the end of August. Amol Savant noted that the target bore size is not given in the build manual. Sid Clark agreed to review this and correct if needed.

5.5) LTMS Change to allow calibration of new IIIF stands with one test.

As another item of new business, Addison Schweitzer proposed allowing new IIIF stand s to calibrate with one test. The main reason for this is due to the limited amount of IIIF/G hardware remaining. It was noted that the current system allows calibration with one test, provided that the test meets a smaller shewhart range (reduced k). Addison and others noted that it is difficult to meet this smaller window for APV, owing to the long term mild APV trend. Rich asked if the stand(s) Addison wished to convert to IIIF were existing or recently calibrated IIIG stands, as those can "dual" calibrate with one test. Addison indicated he thought he had a stand which had been a IIIG stand which required two test. After some discussion, it was decided to discuss this matter the TMC outside of the meeting. It was also suggested that perhaps the reduced K limit could be relaxed for APV only. Given the definitions in the current procedure, it was decided to take no further action on this item. As a review of action items below, Amol noted that there are a couple of changes necessary to the current IIIH forms as a number of average values are whole numbers and should be at least to one decimal place. Rich noted that there were some editorial changes that needed to be made to units and would address all of these in a new version.

6.0) Review Action Items

1) Panel chair to survey active IIIF/G labs to determine number of test remaining.
2) TMC to continue to review IIIHA and B results for adequacy of severity adjustments and appropriateness of calibration criteria.
3) TMC to verify IIIHA data dictionary contains 6 decimal places for MRV_SA and Test Confirmations reflect 6 decimal places for sa's.

7.0) Review Scope and Objectives

Not undertaken during his meeting.

8.0) Next Meeting

8.1) TBD

9.0) Meeting Adjourned

ASTM Sequence III Surveillance Panel   (22 Voting members)

date: 08/17/16

Name/Address			Phone/Fax/Email		Signature
Ed Altman	Y	Y	ed.altman@aftonchemical.com	Voting Member	Present ✓
Jeff Betz	ⱻ	ⱻ	jeff.betz@fcagroup.com	Voting Member	Present
Jason Bowden	Y	Y	jhbowden@ohtech.com	Voting Member	Present ✓
Timothy L. Caudill	Y	Y	tlcaudill@ashland.com SAVANT	Voting Member	Present ✓
Richard Grundza	Y	Y	reg@astmtmc.cmu.edu	Voting Member	Present ✓
Jeff Hsu, PE	Y	Y	j.hsu@shell.com HAUMANN	Voting Member	Present ✓
Teri Kowalski	Y		teri.kowalski@tema.toyota.com	Voting Member	Present ✓
Dan Lanctot	Y	Y	dlanctot@tei-net.com	Voting Member	Present ✓
Patrick Lang	Y	Y	plang@swri.org CHAUDHRY	Voting Member	Present ✓
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Michael Raney			michael.p.raney@gm.com	Voting Member	Present
Andrew Ritchie	Y	Y	andrew.ritchie@infineum.com FARNSWORTH	Voting Member	Present ✓
Ron Romano	Y		rromano@ford.com	Voting Member	Present ✓
Cliff Salvesen			clifford.r.salvesen@exxonmobil.com	Voting Member	Present
Addison Schweitzer	Y	Y	addison.schweitzer@intertek.com	Voting Member	Present ✓
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Kaustav Sinha, Ph.D.	Y	Y	LFNQ@chevron.com STOCKWELL	Voting Member	Present ✓
Thomas Smith			trsmith@ashland.com	Voting Member	Present
Scott Stap			scott.stap@tgidirect.com	Voting Member	Present
George Szappanos	Y	Y	george.szappanos@lubrizol.com	Voting Member	Present ✓
Haiying Tang	Y	Y	HT146@chrysler.com	Voting Member	Present ✓
David Tsui			david.tsui@bp.com	Voting Member	Present

TABLE MOTION   14-0-0

S.A. Da Place   12-0-0

08/17/16

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Tom Wingfield	wingftm@cpchem.com	N-V Member	Present_____

Sequence III Surveillance Panel

August 17, 2016

11:00 – 12:30 EDT

<u>Agenda</u>

1.0) Attendance

2.0) Approval of minutes

2.1) May 26, 2016 teleconference

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4.0) Old Business

4.1) Sequence IIIF/IIIG Rocker Arm situation. Do we have a shortage?

5.0) New Business

5.1) Revision of Sequence IIIHA & IIIHB LTMS to make parameters report and severity adjust only. Eballot issued July 13 with closing date of July 22. Received one negative. **All**

5.2) Review severity of Sequence IIIH, IIIHA & IIIHB. **Grundza**

5.3) Consider adjusting the number of decimal places for MRV reporting. **Schweitzer**

5.4) July 28, 2016 version of Sequence IIIH procedure is available at the ASTM-TMC web site. ftp://ftp.astmtmc.cmu.edu/docs/gas/ChryslerIIIH/procedure_and_ils/DRAFT_IIIH_Procedure_July%2028%202016.pdf

6.0) Review Action Items

7.0) Review Scope and Objectives

8.0) Next Meeting
      8.1) TBD

9.0) Meeting Adjourned

Evaluation of IIIH MRV Severity Adjustment Decimal Precision

Martin Chadwick & Addison Schweitzer

IIIH MRV calculations are performed using a natural log transform.

Severity adjustments are calculated by ($-Z_i$ x MRV SA s)

- Z_i is reported to three decimal places by TMC and limited to +/- 1.800 by LTMS
- MRV SA s = 0.4725

Current IIIH MRV severity adjustments are reported to two decimal places.

The current candidate pass limit is 60,000 cP

Two decimal SA requires Z_i difference of 0.020 for each 0.01 increment in SA. The limiting 0.01 increment in SA represents ~258-1,397 cP*

Three decimal SA requires Z_i difference of 0.002 for each 0.001 increment in SA. The limiting 0.001 increment in SA represents ~25-140 cP*

At a four decimal SA each Z_i difference of 0.001 is ~0.0005 increment in SA. A 0.001 increment in Z_i represents ~10-70 cP*

At a five decimal SA each Z_i difference of 0.001 is ~0.00047 increment in SA. A 0.001 increment in Z_i represents ~12-67 cP*

At a six decimal SA each Z_i difference of 0.001 is ~0.000472 increment in SA. A 0.001 increment in Z_i represents ~12-66 cP*

*** When adjusting to 60,000 cP between -1.800 and 1.800 Zi**

Due to rounding differences each successive 0.001 change in Zi may result in a severity adjustment impact at the pass limit that toggles higher and lower in steps. As severity adjustment decimal precision increases this effect is reduced.

At four decimal places the toggle effect is observed on ~39% of Zi results and is a maximum of 15 cP*; five is 29% with 3 cP* max and six is 24% with 2 cP* max.

* When adjusting to 60,000 cP between -1.800 and 1.800 Zi

(Examples on next slide)

Zi	SA (x.xx)	Client Result	Adj Result	Client Delta	SA (x.xxx)	Client Result	Adj Result	Client Delta	SA (x.xxxx)	Client Result	Adj Result	Client Delta	SA (x.xxxxx)	Client Result	Adj Result	Client Delta	SA (x.xxxxxx)	Client Result	Adj Result	Client Delta
-1.800	0.85	25,645	60,000	0	0.851	25,619	60,000	26	0.8505	25,632	60,000	13	0.85050	25,632	60,000	12	0.850500	25,632	60,000	12
-1.799	0.85	25,645	60,000	0	0.850	25,645	60,000	0	0.8500	25,645	60,000	10	0.85003	25,644	60,000	12	0.850028	25,644	60,000	12
-1.790	0.85	25,645	60,000	0	0.846	25,748	60,000	25	0.8458	25,753	60,000	13	0.84578	25,753	60,000	13	0.845775	25,753	60,000	13
-1.789	0.85	25,645	60,000	258	0.845	25,773	60,000	0	0.8453	25,766	60,000	13	0.84530	25,766	60,000	12	0.845303	25,766	60,000	12
-1.788	0.84	25,903	60,000	0	0.845	25,773	60,000	26	0.8448	25,779	60,000	10	0.84483	25,778	60,000	12	0.844830	25,778	60,000	12
-0.562	0.27	45,803	60,000	0	0.266	45,986	60,000	46	0.2655	46,009	60,000	19	0.26555	46,007	60,000	22	0.265545	46,007	60,000	22
-0.561	0.27	45,803	60,000	460	0.265	46,032	60,000	0	0.2651	46,028	60,000	23	0.26507	46,029	60,000	22	0.265073	46,029	60,000	22
-0.560	0.26	46,263	60,000	0	0.265	46,032	60,000	46	0.2646	46,051	60,000	23	0.26460	46,051	60,000	21	0.264600	46,051	60,000	22
-0.012	0.01	59,403	60,000	0	0.006	59,641	60,000	60	0.0057	59,659	60,000	30	0.00567	59,661	60,000	28	0.005670	59,661	60,000	28
-0.011	0.01	59,403	60,000	597	0.005	59,701	60,000	0	0.0052	59,689	60,000	30	0.00520	59,689	60,000	28	0.005198	59,689	60,000	28
-0.010	0.00	60,000	60,000	0	0.005	59,701	60,000	59	0.0047	59,719	60,000	24	0.00473	59,717	60,000	29	0.004725	59,717	60,000	28
-0.001	0.00	60,000	60,000	0	0.000	60,000	60,000	0	0.0005	59,970	60,000	30	0.00047	59,972	60,000	28	0.000473	59,972	60,000	28
0.000	0.00	60,000	60,000	0	0.000	60,000	60,000	0	0.0000	60,000	60,000	30	0.00000	60,000	60,000	28	0.000000	60,000	60,000	28
0.001	0.00	60,000	60,000	0	0.000	60,000	60,000	60	-0.0005	60,030	60,000	24	-0.00047	60,028	60,000	28	-0.000472	60,028	60,000	29
0.009	0.00	60,000	60,000	0	-0.004	60,240	60,000	61	-0.0043	60,259	60,000	24	-0.00425	60,256	60,000	28	-0.004252	60,256	60,000	28
0.010	0.00	60,000	60,000	603	-0.005	60,301	60,000	0	-0.0047	60,283	60,000	30	-0.00472	60,284	60,000	29	-0.004725	60,284	60,000	29
0.011	-0.01	60,603	60,000	0	-0.005	60,301	60,000	60	-0.0052	60,313	60,000	30	-0.00520	60,313	60,000	28	-0.005197	60,313	60,000	28
0.559	-0.26	77,816	60,000	0	-0.264	78,128	60,000	78	-0.2641	78,136	60,000	39	-0.26413	78,138	60,000	37	-0.264127	78,138	60,000	37
0.560	-0.26	77,816	60,000	782	-0.265	78,206	60,000	0	-0.2646	78,175	60,000	39	-0.26460	78,175	60,000	36	-0.264600	78,175	60,000	36
0.561	-0.27	78,598	60,000	0	-0.265	78,206	60,000	78	-0.2651	78,214	60,000	31	-0.26507	78,211	60,000	37	-0.265072	78,211	60,000	37
1.787	-0.84	138,982	60,000	0	-0.844	139,539	60,000	140	-0.8444	139,595	60,000	56	-0.84436	139,589	60,000	66	-0.844357	139,589	60,000	66
1.788	-0.84	138,982	60,000	1,397	-0.845	139,679	60,000	0	-0.8448	139,651	60,000	70	-0.84483	139,655	60,000	66	-0.844830	139,655	60,000	66
1.789	-0.85	140,379	60,000	0	-0.845	139,679	60,000	139	-0.8453	139,721	60,000	69	-0.84530	139,721	60,000	65	-0.845302	139,721	60,000	66
1.799	-0.85	140,379	60,000	0	-0.850	140,379	60,000	0	-0.8500	140,379	60,000	70	-0.85003	140,383	60,000	66	-0.850027	140,383	60,000	66
1.800	-0.85	140,379	60,000	0	-0.850	140,379	60,000	0	-0.8505	140,449	60,000	70	-0.85050	140,449	60,000	66	-0.850500	140,449	60,000	66

Report IIIH MRV Severity Adjustments to five or six decimal places.

The TMC might consider a rule of thumb for all severity adjustments in transformed space of at least six decimal places. Additionally, untransformed severity adjustments should be reported to the same decimal precision as the final adjusted result to minimize confusion.