



## Test Monitoring Center

@ Carnegie Mellon University  
6555 Penn Avenue, Pittsburgh, PA 15206, USA

<http://astmtmc.cmu.edu>  
412-365-1000

MEMORANDUM: 16-040

DATE: November 7, 2016

TO: Yong-Li McFarland,  
Chairwoman, Engine Oil Filterability Test Surveillance Panel

FROM: Michael T. Kasimirsky *Michael T. Kasimirsky*

SUBJECT: EOWT Testing from April 1, 2016 through September 30, 2016

A total of 958 EOWT tests were reported to the Test Monitoring Center during the report period from April 1, 2016 through September 30, 2016.

Please find attached a summary of testing activity this period.

MTK/mtk/astm1016.doc/mem16-040.mtk.doc

cc: F. M. Farber

J. A. Clark

EOWT Surveillance Panel

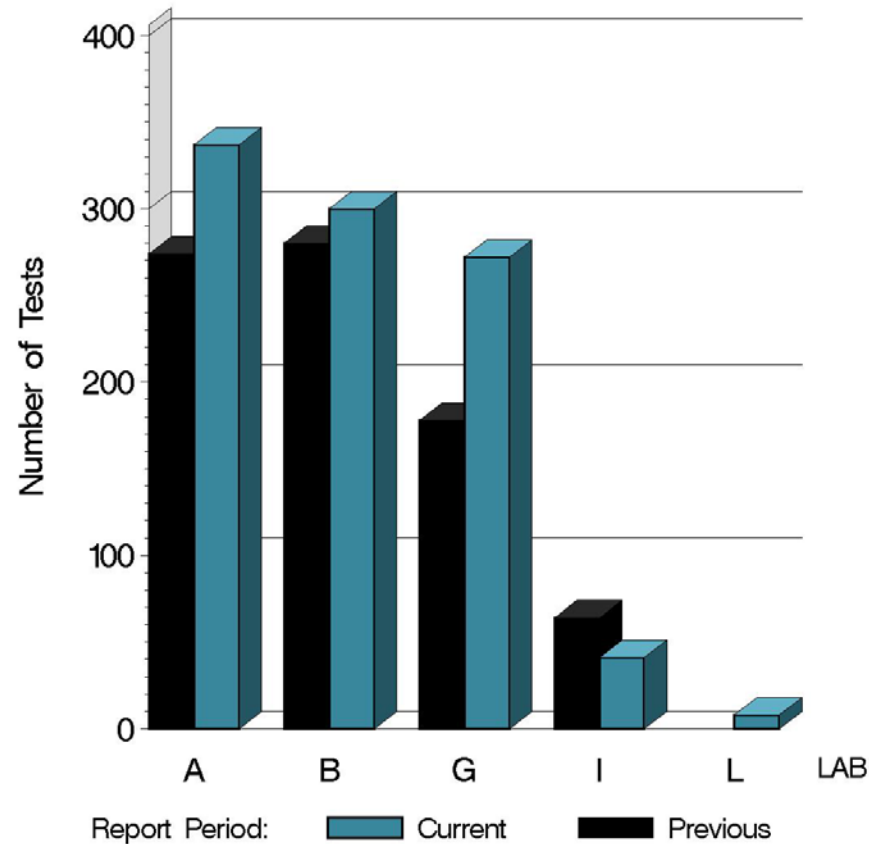
<ftp://ftp.astmtmc.cmu.edu/docs/bench/eowt/semiannualreports/eowt-10-2016.pdf>

Distribution: email

# EOWT (D 6794)

|                | Reporting Data |
|----------------|----------------|
| Number of Labs | 5              |

NUMBER OF TESTS REPORTED  
BY LAB AND REPORT PERIOD



14:30:20 07NOV2016

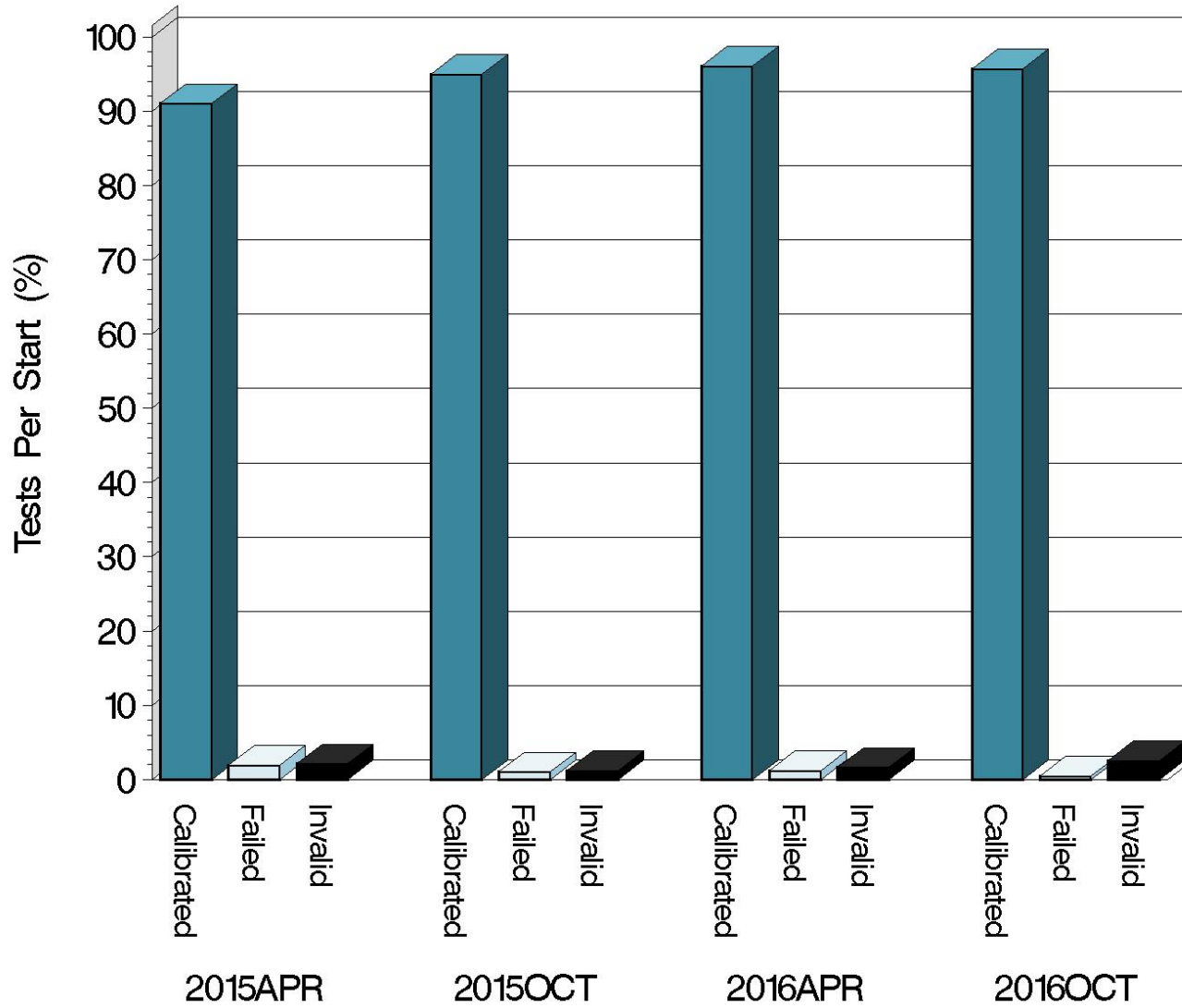
# EOWT (D 6794)

## Test Distribution by Oil and Validity

|                                 |    | By Oil     |           |          |            | By Treat Level |            |            |            | Totals      |             |
|---------------------------------|----|------------|-----------|----------|------------|----------------|------------|------------|------------|-------------|-------------|
|                                 |    | 77-2       | 77-3      | 78-2     | 79         | 0.6            | 1.0        | 2.0        | 3.0        | This Period | Last Period |
| Accepted for Calibration        | AC | 464        | 0         | 6        | 447        | 230            | 230        | 230        | 227        | 917         | 765         |
| Rejected Tests                  | OC | 5          | 0         | 0        | 0          | 1              | 0          | 0          | 4          | 5           | 10          |
| Operationally Invalid (lab)     | LC | 1          | 0         | 0        | 2          | 2              | 1          | 0          | 0          | 3           | 1           |
| Operationally Invalid (lab/TMC) | RC | 0          | 0         | 0        | 0          | 0              | 0          | 0          | 0          | 0           | 0           |
| Aborted Calibration             | XC | 15         | 0         | 0        | 6          | 5              | 6          | 5          | 5          | 21          | 12          |
| Unusable Calibration            | MC | 0          | 0         | 0        | 0          | 0              | 0          | 0          | 0          | 0           | 0           |
| Acceptable Donated Tests        | NI | 0          | 12        | 0        | 0          | 3              | 3          | 3          | 3          | 12          | 8           |
| Unacceptable Donated Tests      | MI | 0          | 0         | 0        | 0          | 0              | 0          | 0          | 0          | 0           | 0           |
| Invalid Donated Tests           | LI | 0          | 0         | 0        | 0          | 0              | 0          | 0          | 0          | 0           | 0           |
| Aborted Donated Tests           | XI | 0          | 0         | 0        | 0          | 0              | 0          | 0          | 0          | 0           | 0           |
| <b>Total</b>                    |    | <b>485</b> | <b>12</b> | <b>6</b> | <b>455</b> | <b>241</b>     | <b>240</b> | <b>238</b> | <b>239</b> | <b>958</b>  | <b>796</b>  |

# EOWT (D 6794)

## CALIBRATION ATTEMPT SUMMARY



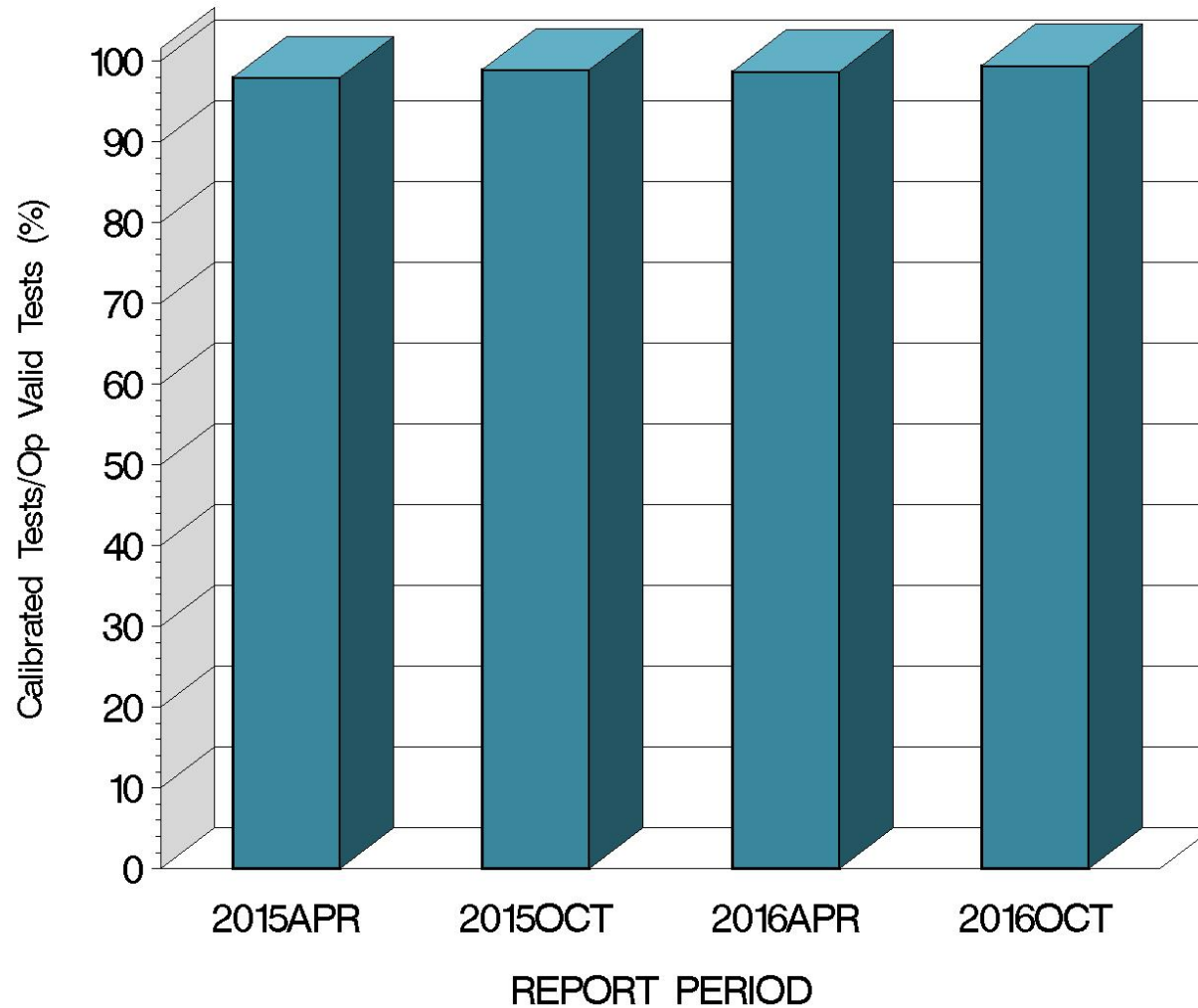
Resolution

Report Period

14:30:20 07NOV2016

# EOWT (D 6794)

OPERATIONALLY VALID TESTS  
MEETING ACCEPTANCE CRITERIA



14:30:20 07NOV2016

# EOWT (D 6794)

## CAUSES FOR LOST TESTS

| Lab | Cause             | Oil  |      |      |     | Validity |           |     | Loss Rate |        |     |
|-----|-------------------|------|------|------|-----|----------|-----------|-----|-----------|--------|-----|
|     |                   | 77-2 | 77-3 | 78-2 | 79  | LC       | RC/<br>MC | XC  | Lost      | Starts | %   |
| A   | Sample Prep Error | 4    | 0    | 0    | 1   | 2        | 0         | 3   | 5         | 337    | 1.5 |
| B   | Sample Prep Error | 8    | 0    | 0    | 0   | 0        | 0         | 8   | 8         | 300    | 2.7 |
|     | Computer Failure  | 0    | 0    | 0    | 6   | 0        | 0         | 6   | 6         | 300    | 2.0 |
| G   | Sample Prep Error | 4    | 0    | 0    | 1   | 1        | 0         | 4   | 5         | 272    | 1.8 |
|     | Lost              | 16   | 0    | 0    | 8   | 3        | 0         | 21  |           |        |     |
|     | Starts            | 485  | 12   | 6    | 455 | 958      | 958       | 958 |           |        |     |
|     | %                 | 3.3  | 0    | 0    | 1.8 | 0.3      | 0         | 2.2 |           |        |     |

1

Lost tests are calibration attempts that were either aborted or operationally invalid

# EOWT (D 6794)

| Average $\Delta/s$ By Laboratory |          |     |        |
|----------------------------------|----------|-----|--------|
| Treat Level                      | Lab      | n   | CFAYI  |
| 0.6                              | A        | 84  | -0.023 |
|                                  | B        | 69  | 1.024  |
|                                  | G        | 67  | 1.065  |
|                                  | I        | 9   | 0.173  |
|                                  | L        | 2   | 0.314  |
|                                  | Industry | 231 | 0.616  |
| 1.0                              | A        | 82  | -0.165 |
|                                  | B        | 69  | 0.828  |
|                                  | G        | 67  | 1.114  |
|                                  | I        | 10  | 0.727  |
|                                  | L        | 2   | -0.074 |
|                                  | Industry | 230 | 0.545  |
| 2.0                              | A        | 82  | 0.202  |
|                                  | B        | 70  | 0.882  |
|                                  | G        | 67  | 0.980  |
|                                  | I        | 9   | 0.406  |
|                                  | L        | 2   | -0.406 |
|                                  | Industry | 230 | 0.638  |
| 3.0                              | A        | 84  | 0.202  |
|                                  | B        | 70  | 1.108  |
|                                  | G        | 66  | 1.177  |
|                                  | I        | 9   | 0.986  |
|                                  | L        | 2   | 0.183  |
|                                  | Industry | 231 | 0.786  |

# EOWT (D 6794)

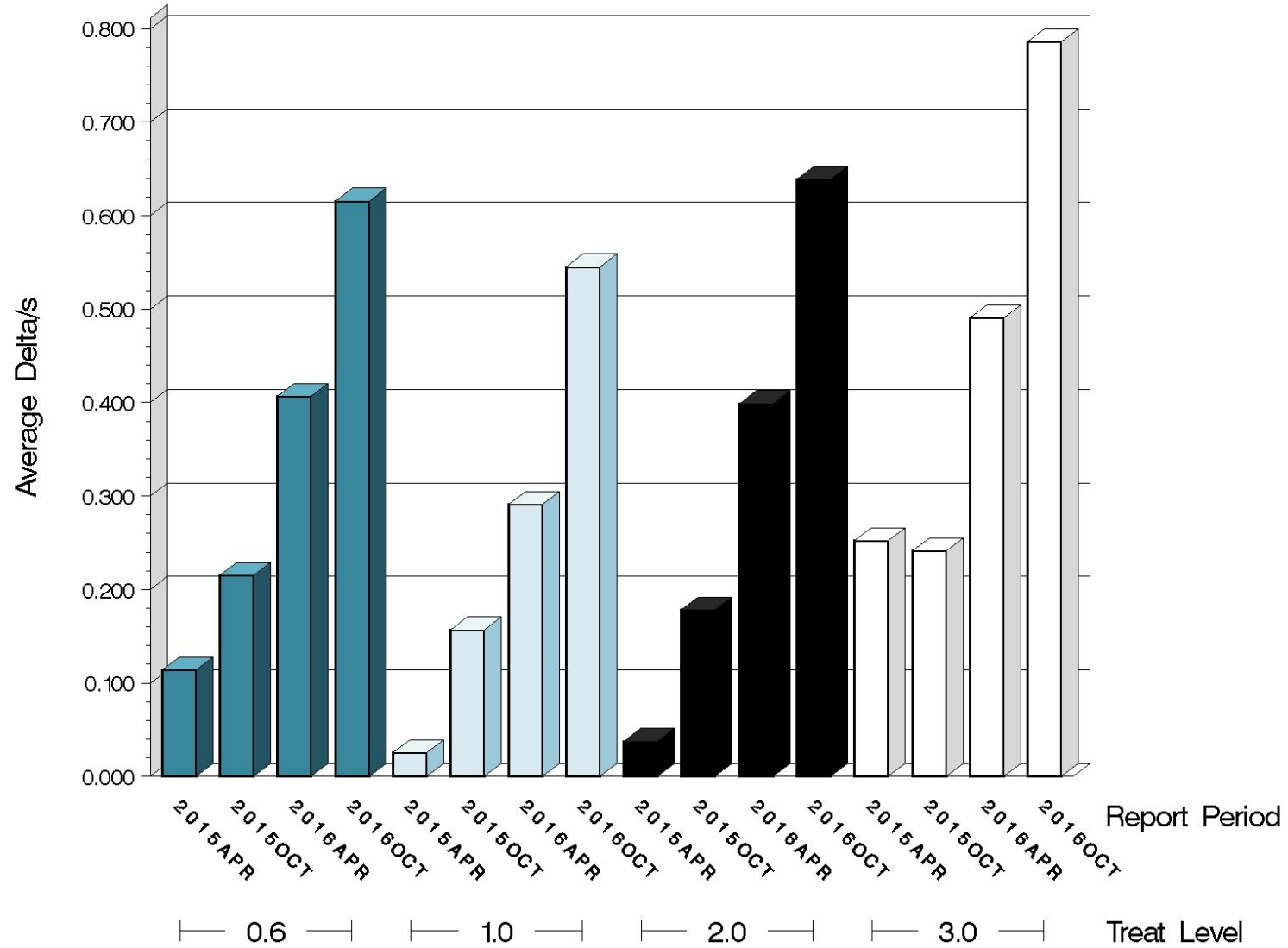
Individual test results can be found on the TMC Web Page at the following link:

<ftp://ftp.astmtmc.cmu.edu/refdata/bench/eowt/data/>



# EOWT (D 6794)

## AVERAGE DELTA/S



14:30:20 07NOV2016

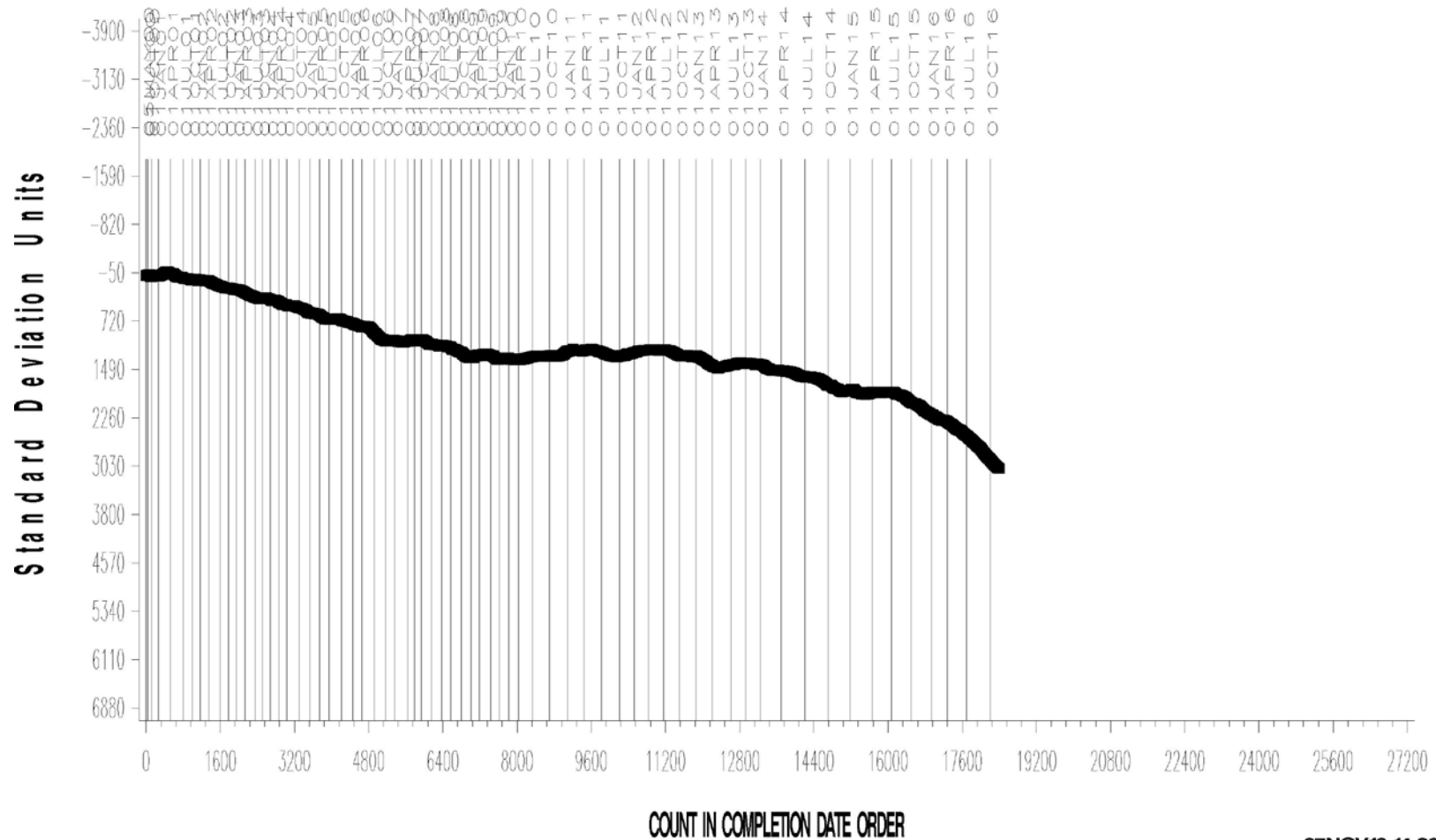
# EOWT (D 6794)

EOWT INDUSTRY OPERATIONALLY VALID DATA



20 – 25 ML CHANGE IN FLOWRATE AVG.

## CUSUM Severity Analysis

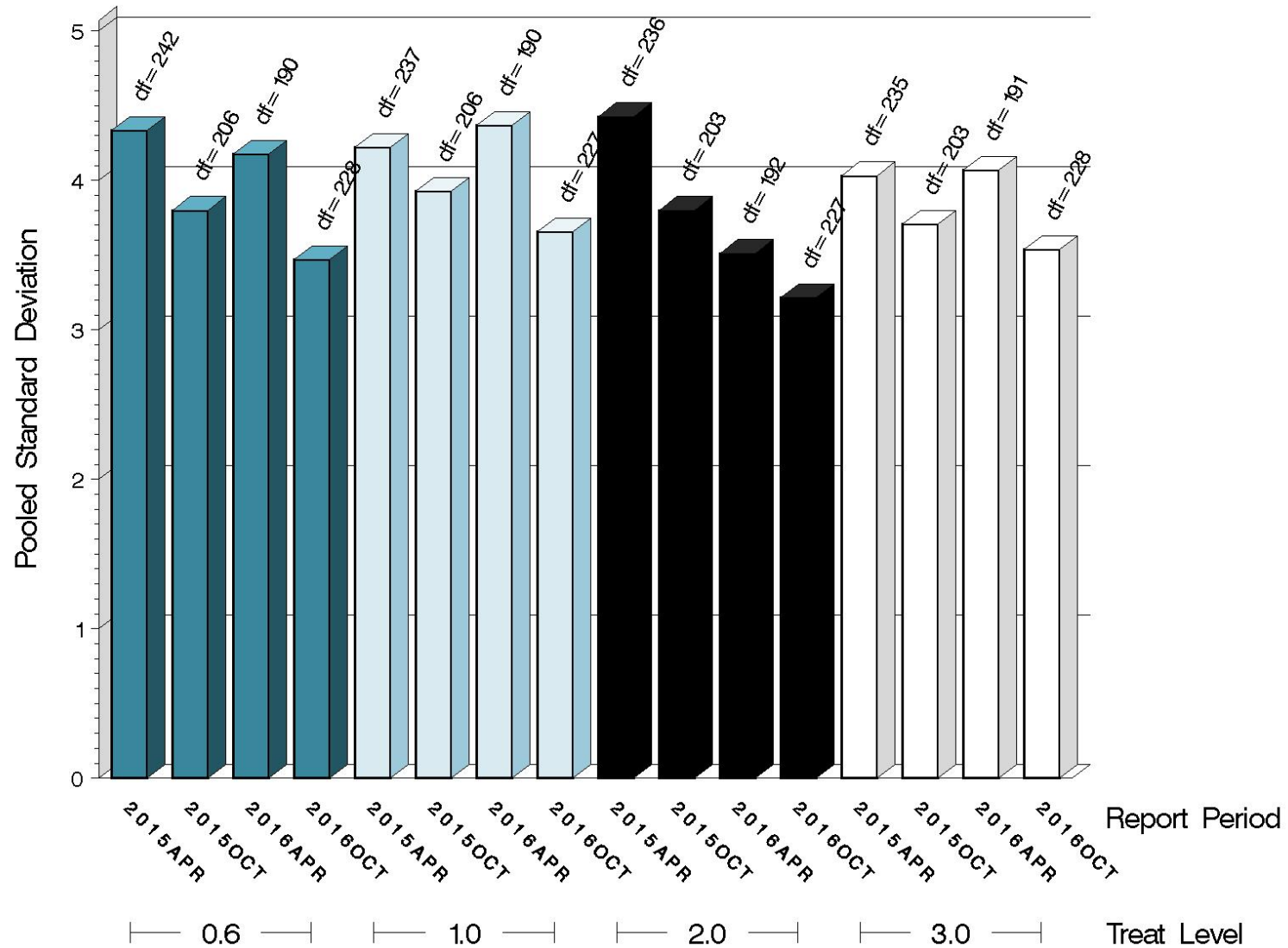


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# EOWT (D 6794)

## POOLED STANDARD DEVIATION



14:30:20 07NOV2016

# EOWT (D 6794)

## SUMMARY OF SEVERITY & PRECISION

### Severity

Over the course of this report period, CIFA severity, as measured by CUSUM plotting, is severe.

### Precision

Pooled  $s$  values for this period are 3.47 (0.6%), 3.66 (1.0%), 3.21 (2.0%), and 3.54 (3.0%).

Precision, as measured by pooled standard deviation, is better than previous periods, but still comparable to historical performance.

# EOWT (D 6794)

## INFORMATION LETTERS

No EOWT Information Letters were issued this period.

# EOWT (D 6794)

## STATUS OF REFERENCE OIL SUPPLY

| Oil   | Samples @<br>Labs | @ TMC               |         |
|-------|-------------------|---------------------|---------|
|       |                   | Samples<br>(290 mL) | Gallons |
| 77-2  | 123               | 248                 | 19.1    |
| 77-3  | 63                | 11,572              | 891.1   |
| 78-2  | 0                 | 0                   | 0.0     |
| 79    | 129               | 11,135              | 857.4   |
| Total | 315               | 22,955              | 1,767.6 |

The TMC inventory of oil 77-2 is nearly depleted.

The TMC has procured a reblend of oil 77-2, reference oil 77-3, which has been introduced into EOWT.

Testing on reference oil 77-3 will begin when the current inventory of reference oil 77-2 is depleted.