

MM AND FILTER DATA COLLECTION

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Performance you can rely on.



Goal: Compile all the data available

Note that profiles are needed, so operational data are needed, not just final aeration values.

1. Identify existing data and new data:
 - Update existing LTMS file adding need **new columns** to the file (refer to slide 3)
 - Update existing LTMS file adding need **new rows** to the file: MM Testing data that are not part of the LTMS file would be added to the LTMS file for oils K, oil G, 832, 833 and 1005. **It was clarified that there are no new rows for these oils**
2. On test operational data is needed to build profiles
3. Warm-up data needed to obtain MM density: how accurate is the MM? we could potentially learn more about the filters (initial state)
4. During recent SP meeting, we talked about confounding and that there are other factors that impact aeration: What are they? Are these being recorded already?
5. On test data format: Please, add Lab and Oil to the format used for the VGRA data file
6. Data location: Data could be sent to the TMC (Sean is ok with it)
7. **7/22/2016 Tim Griffin created a copy of the LTMS file with additional columns and sent to Greg Miranda and Jim Carroll, so that their data can be added. When the data are ready TMC will save the file**
8. **For additional clarifications obtained during the 07/22/2016 meeting, please refer to slides 3, 4 and 5**

Required data: Preliminary thoughts to start the discussion



TESTKEY	LTMSLAB	MMSERNO	MM model	transmitter model	transmitter SERNO	last MM calibration date	calibration location	ASK EMERSON any software change during MM life (yes or no)	ASK EMERSON any software change during transmitter life (yes or no)	flange description

Use meter instead of MM

Already part of the ltms file

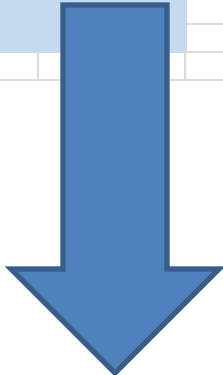
ASK EMERSON any software change during MM life (yes or no)

ASK EMERSON any software change during transmitter life (yes or no)

Add processor
Talk to Emerson about 8 coefficients

blue cells: existing data

yellow cells: ask Emerson



Currently, two labs are using numbers; one lab using model

OILFILDC	# of pleats	porus size	filter origin	number of shutdowns before 30 hours

Do not have this info yet

Already part of the ltms file

Reminder: OILFILDC stamped on the part

MM testing data shared in April 2016: review nomenclature and what has changed from one test to another: model, transmitter or both? Oil? Test validity?



Are these tests included in the LTMS file? If Ref oils, yes.

Industry MM Usage					
Lab		Sensor Model #	Transmitter Model #	Date Installed	Flange Description
SwRI	MicroMotion used during COAT Precision Matrix	CMF025M319NU	RFT9739E4SMA	4/15/2013 is the date that the first test data was recorded.	319 is #8 VCO fitting
SwRI	Active MicroMotion used in test stand	Same	Same	Reinstalled after calibration at Emerson on 2/1/2016	319 is #8 VCO fitting
ICES	MicroMotion used during COAT Precision Matrix	CMF025M313NU	RFT9739E4SUJ	7/2014 Started; 1/2015 Ended	313 is 1/2" Weld Neck Flange
ICES	MicroMotion used during Aeration Testing	CMF025M313NU	RFT9739E4SUJ	7/30/2015 Removed after seeing a density shift during 50 hour test and could not determine cause.	313 is 1/2" Weld Neck Flange
ICES	MicroMotion used during COAT VGRA Matrix	CMF025M313N2 BAE3ZZ	5700R12ABAAZZZ w/ PUCK800	8/21/2015 Installed; 10/2015 started VGRA; 12/2015 ended VGRA	313 is 1/2" Weld Neck Flange
ICES	Active MicroMotion used for test stand	CMF025M313N2 BAE3ZZ	5700R12ABAAZZZ w/ PUCK800	Next MM Calibration expected in 8/2016	313 is 1/2" Weld Neck Flange
LZ	MicroMotion used during COAT Precision Matrix	CMF025M319NU	RFT9739E4SUJ	Installed July 2014 and utilized for both the Prove-Out and Precision Matrix	319 is #8 VCO fitting
LZ	NEW MicroMotion (Acquired Jan 2016)	CMF025M319NB AEZZZ	PUCK800	Newly Acquired (not utilized for testing)	319 is #8 VCO fitting



Any new data?

It was stated in the July 6th telecon that SwRI experienced a 1.5% shift up with the Puck800. In this experiment, was the sensor model the SAME? Yes

Both changed

What is the difference between CMF025M319NU and CMF025M319NB AEZZZ?

Testkey 110231

Does Flange affect aeration?

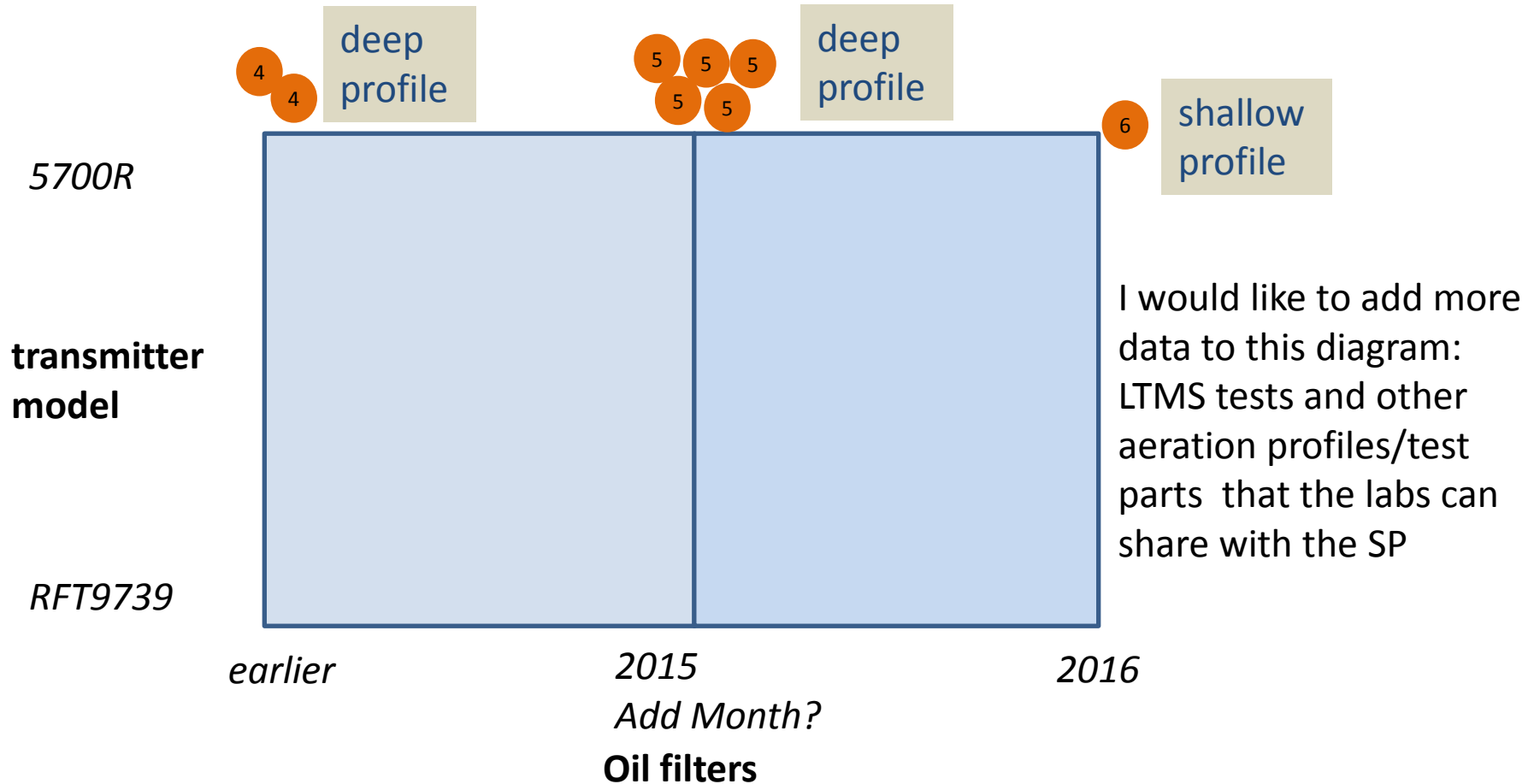
“Oil filters/ transmitter” changes over time



During last SP meeting, SwRI and IAR shared data showing “shallow” aeration profiles associated with 2016 oil filters. I will add these tests to the diagram below when the LTMS file is updated

Legend
Data available

● Lab G



APPENDIX

Performance you can rely on.



LTMS data: Example Lab G



Does the table below capture the data properly?
 Should additional columns be included?
 Flange type? How many fields to describe flange?
 "Puck/Transmitter" = 5700R



TESTKEY	LTMSLAB	LTMSDATE	MMSERNO	transmitter model	transmitter SERNO	meter SERNO
103954-COAT	G	20141206	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103455-COAT	G	20141208	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103468-COAT	G	20141211	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103462-COAT	G	20141214	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
104083-COAT	G	20141216	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103629-COAT	G	20141219	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
106458-COAT	G	20150130	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
100263-COAT	G	20150311	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
110235-COAT	G	20150902	CMF025M;5700R	5700R	12120911	
110728-COAT	G	20150906	CMF025M;5700R	5700R	12120911	
109830-COAT	G	20150912	CMF025M;5700R	5700R	12120911	
111346-COAT	G	20151014	CMF025M;5700R	5700R	12120911	
111347-COAT	G	20151205	CMF025M;5700R	5700R	12120911	
112704-COAT	G	20160317	CMF025M;5700R	5700R	12120911	
112705-COAT	G	20160702	CMF025M;5700R	5700R	12120911	

MM Experiments: Questions for all labs



- When did the labs undergo calibration for the operational measurements as per section 8.3.1.1 relative to when the new sensors / new transmitters were used?
- What densities were recorded during warm-up with new sensor vs old sensor, with new transmitter vs old transmitter?
- How different were the temperature drops across the MM? Although within spec, 0.9 deg C difference vs a 0.1 deg C difference can help contribute to some differences.
- Has anything changed about the engine (new block, new gasketing, etc.)? Did Si levels remain passivated for all MM experiments?
- Do we expect 313 vs 319 flange to affect aeration? If so, can we run an experiment to confirm?

5700R = PUCK800



- The puck800 is the inner core of the transmitter. Basically, the processor. We went from 700 core processors to 800 core processors about 4-5 years ago. All 5700's have 800 cores but no 9739's do.

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