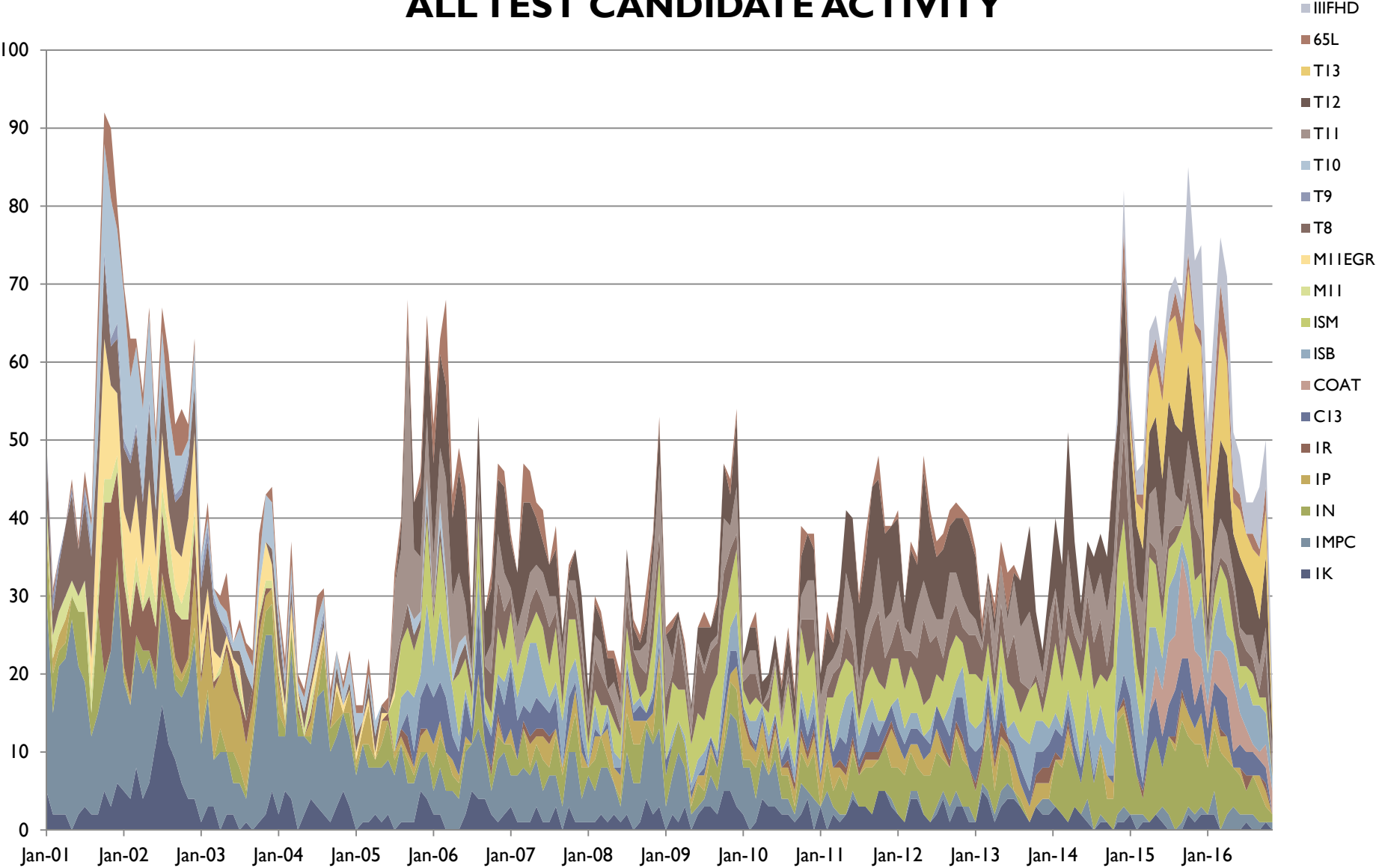


D02.B0.02 Maintenance Report

December 2016

ALL TEST CANDIDATE ACTIVITY



Calibrated Labs and Stands*

Test	Labs	Stands
IK	1	1
IN	4	5
IM-PC	1	1
IP	3	3
IR	1	1
CI3	3	3
ISB	3	5
ISM	4	4
EOAT	0	0
RFWT	2	2
T-8/E	2	3
T-11	4	5
T-12/T-12A	4	7
T-13	5	10
COAT	3	3
DDI3	3	5

*As of 09/30/2016

Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
Cat IK/IN	Auxiliary components	Likely	1980's vintage engine. Ongoing resolution of issues with auxiliary stand and miscellaneous components.
Cat IP/IR	Crankshaft	Likely	1990's vintage engine. Crankshaft supplier has been identified by Caterpillar.
Cat C13	New liners – references anticipated Oct 2016 – Not yet run.	Likely	<p>Engine block, injectors, turbos only available through reman.</p> <p>Liners with new material and processing but same specs will be introduced mid-2017.</p> <p>New batch of current liners produced.</p>



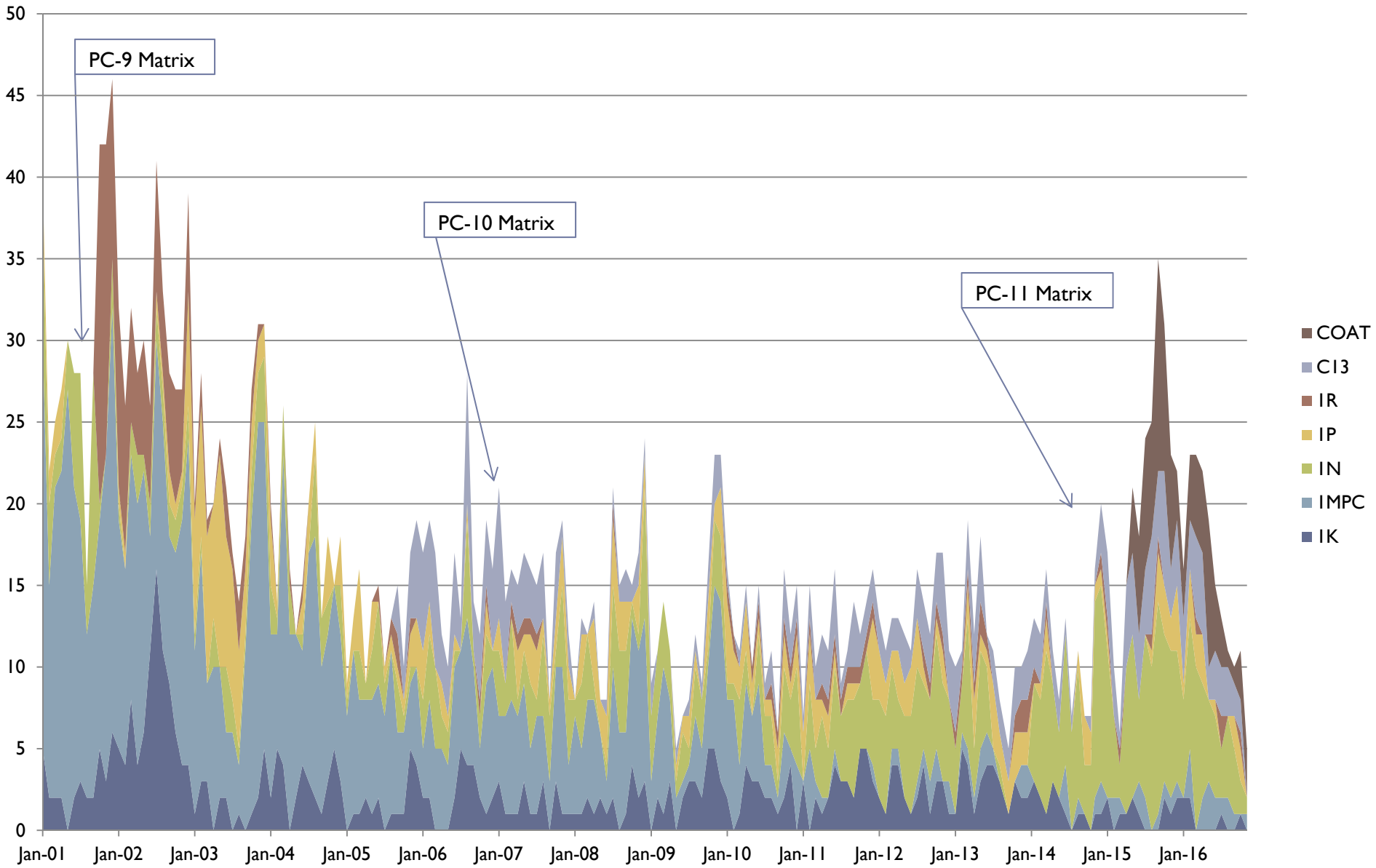
Additional Caterpillar Test Issues

- **Caterpillar Oil Aeration Test**

- Surveillance panel working with micro-motion manufacturer on instrument software and calibration standardization across labs.



CATERPILLAR CANDIDATE ACTIVITY



Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
Mack T-11	Oil Consumption	Likely	<p>Engine production ended 2006. Finite number of engine blocks.</p> <p>Engine build life issues with oil consumption.</p>
Mack T-12	Oil Consumption, head gasket	Likely	<p>Engine production ended 2006. Next ring batch available January 2017. Severity to be determined with coordinated references, plus correction factor updates.</p>



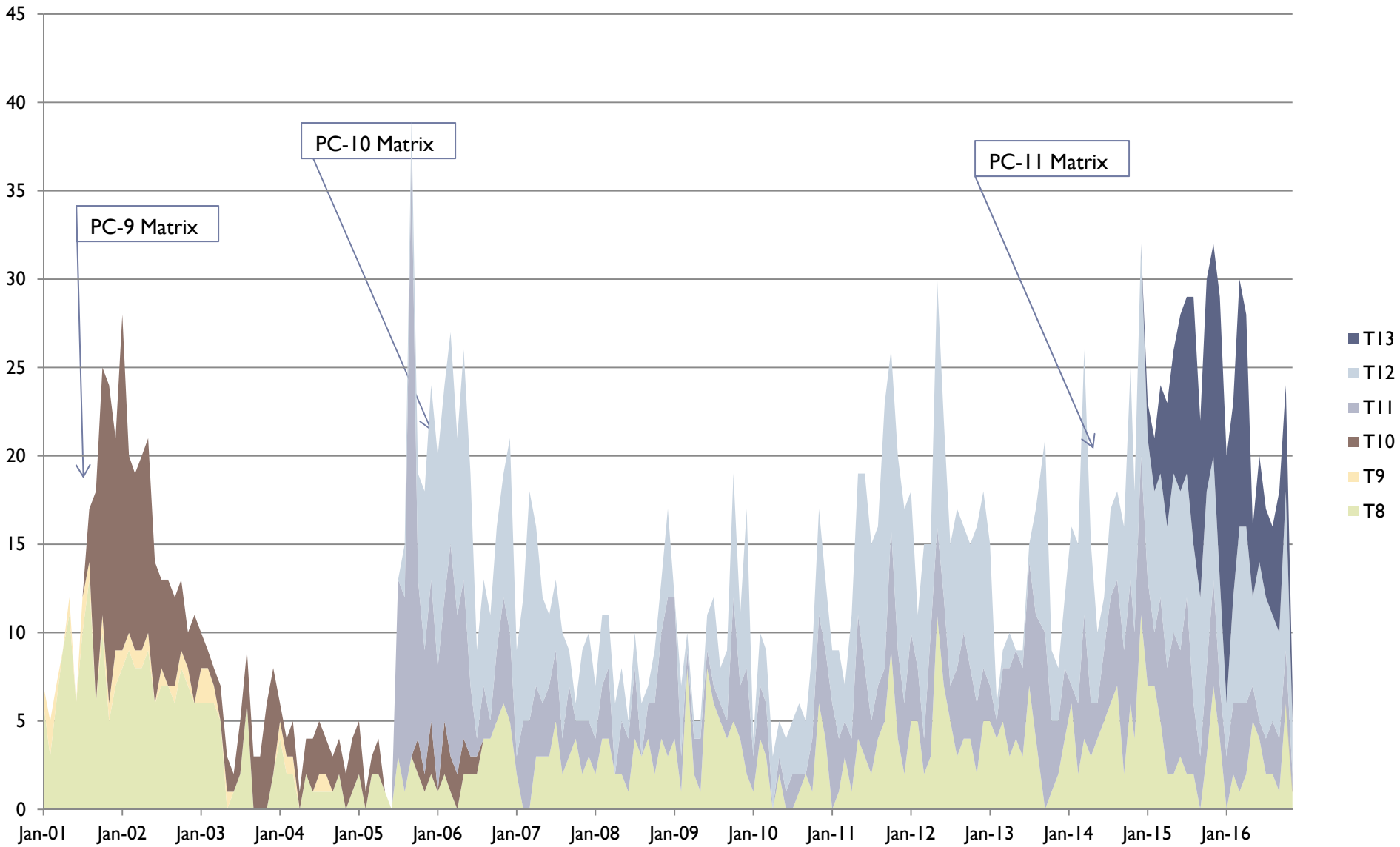
Additional Mack Test Issues

➤ **T-12**

- Procurement of new top ring batch and coordinated references expected January 2017.



MACK CANDIDATE ACTIVITY



Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
Cummins ISM	No current issues	Likely	Cummins is looking at backwards-compatible development using ISX.
Cummins ISB	No current issues	Likely	No current issues.



Cummins Test Surveillance Panel

➤ ISM

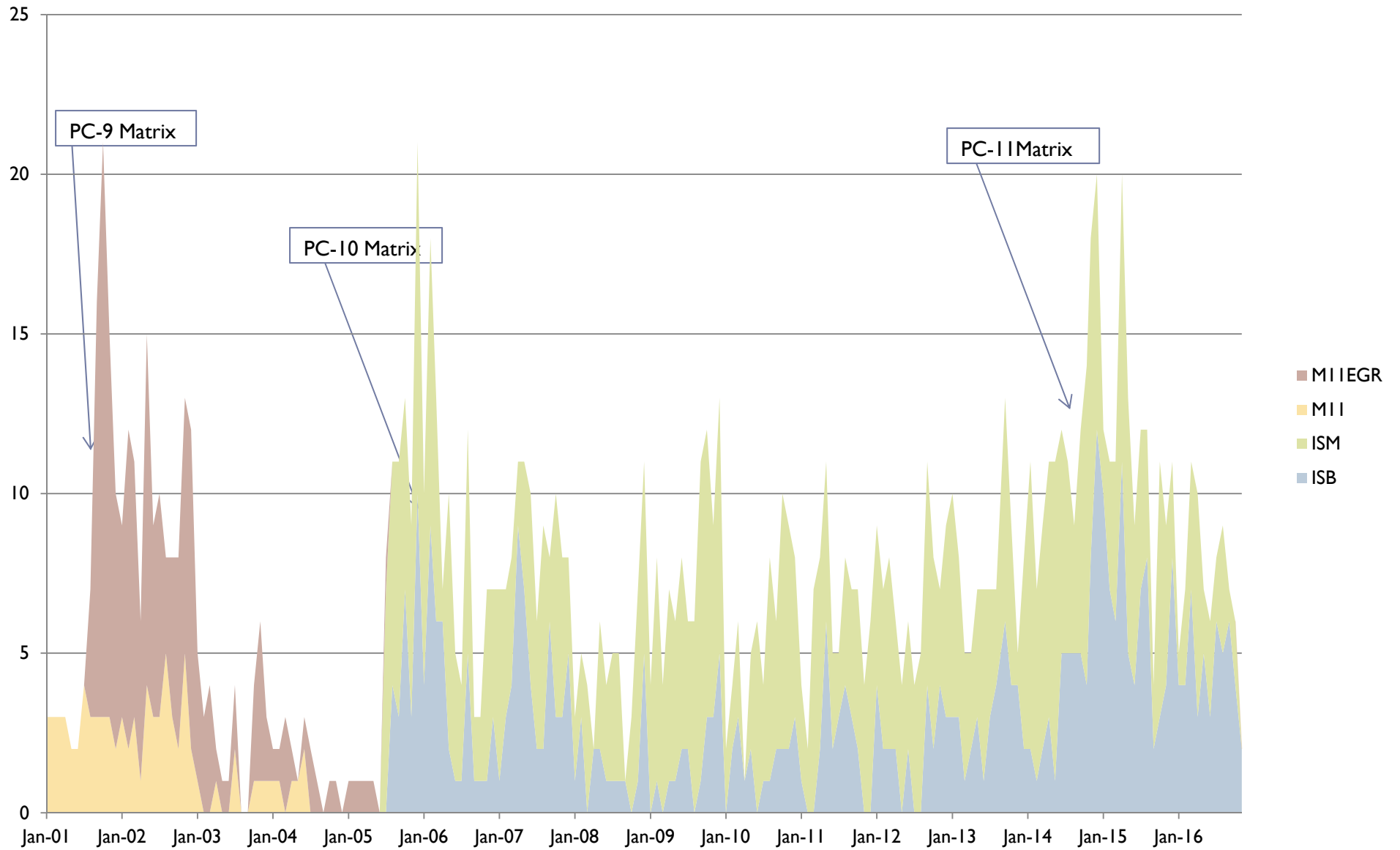
- Cummins looking at possibility of developing backwards-compatible ISX test.

➤ ISB

- No current test issues.



CUMMINS CANDIDATE ACTIVITY



Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
RFWT	Engine configuration	Likely	<p>Long term supply of test parts at CPD.</p> <p>6.5 L engine no longer in production at AM General, but available through supply network.</p> <p>Injection pump still available.</p>
Seq IIIF/IIIG	Hardware depletion Dec 2016	No	<p>Hardware depletion projected IQ 2017. Projected IQ2017 IIH to IIIF and IIH to IIIG correlations.</p>
EOAT	Using last known hardware	No	<p>Oil temperature control issues with last known EOAT engine. Test uses controlled coolant temperature but not controlled oil temperature.</p> <p>Lab determining cause. Unavailable?</p>

Engine Oil Aeration Test Surveillance Panel

- ▶ No reference tests in last 6 months
- ▶ Additional engines are now impossible to source.
 - ▶ Last remaining engine is currently in use.
 - ▶ Test could be declared unavailable at any point.
- ▶ EOAT Panel transferred to CAT panel and correlation work is ongoing.



Roller Follower Wear Test Surveillance Panel

- ▶ One reference tests in last 6 months.
- ▶ Test is in control and at historical levels.
- ▶ No issues to report. Hardware supply available at CPD.



B2 Action Items

- **No Action Items**
- **Comments**

