PC-10 Lessons Learned Question 8

How do we generate the data needed in a timely way to correlate old to new tests so we have fewer active tests?

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Background

- Engine tests for all active API C categories need to be available to continue licensing.
- Test can be available by two methods:
  - The original test can be maintained.
  - An alternative test at limits equivalent to the original limits can be substituted.
- Maintaining fewer tests and establishing equivalent limits may be more cost effective for our industry than maintaining all older tests.
- In many cases older tests can not be maintained due to hardware and fuel issues.

Current Approach to Determining Equivalent limits in New Tests

- A trade association or company makes a proposal to use a different test to support an older category, for example the T-10 to replace the T-6.
- The need to replace the old test is based on the desire to keep an older API C category, for example API CF-4, licensable.
- The request is often prompted by the inability to run the old test because of parts, fuel, or lack of test capacity.
- Data is volunteered by interested parties to support equivalent limits. The HDEOCP reviews the data and if there is enough support a ballot is issued.
- The ballot is handled thru the normal ASTM process.

Issues with the Current Process

- Process usually started only after issues arise with older tests.
- Equivalent limits established long after introduction of new test so old test is maintained far longer than necessary.
- Limited data generated by volunteers.
- Data often generated by candidate testing and not focused on the question of substituting tests.

Way Forward

- No change to HDEOCP process to review/ballot substitution of new tests for old tests at equivalent limits.
- Run ref oils from old tests in new test precision/BOI/VGRA matrix to determine if new test can replace an old test and at what equivalent limits. Maintain robustness of precision/BOI/VGRA matrix; do not sacrifice precision estimate. Will likely require more testing.
- Cost of industry cooperative testing to be built into industry matrix costs.
- Request that the submitter of new ref oils provide data (field, dyno, bench, and/or predicted tests) on relevant old and new tests to supplement the industry precision data. Places additional requirements on ref oil suppliers.
- Request TMC co-ordinate with the ref oil suppliers to assure all ref oils are maintained until the API LC declares a category obsolete.
- Request TMC maintains documentation for historical ref oils; medians, means, transformations, and number of observations.
- Review the TMC ref oils to determine if we have oils with performance on both sides of the pass/fail limits in all engine tests. This will facilitate setting limits in new tests which are equivalent to the limits in the old test. May require additional testing on an expanded number of ref oils.
- Replacement testing required between upgrades to continue under current process.