API 16TR1
January 2018

Shear Ram Performance Test Protocol
Update
API 16TR1 Scope

• This document outlines the standardized test protocol, including data and reporting requirements, for performing a BOP shear ram performance test
  • Measure the BOP operator force required to shear drill pipe and tubing.
  • Measure the BOP operator force required to seal after a shear.
• The objective of this protocol is to standardize the execution of shear testing and recording of data related to the test.
API 16TR1 History

• Developed a protocol under IOGP with 9 drilling contractor’s and operator’s company shear test procedures
• Stress Engineering put together final procedure working with the Task Group
• Protocol was put into API format (16TR2) and released for Comment Ballot in April 2016
• Comment Ballot closed June 2016
• Addressed all comments and redrafted protocol – sent to API June 2017 (16TR1)
API 16TR1 History

- API 1\textsuperscript{st} Ballot results:

<table>
<thead>
<tr>
<th>Balloting Totals:</th>
<th>Affirmative</th>
<th>Negative</th>
<th>Abstain</th>
<th>Did Not Vote</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

- Total Responses: 29
- Total Ballots: 34
- Response Rate \((\text{Affirmative} + \text{Negative} + \text{Abstain}) / \text{Total Ballots}\): 85\% Must be > 50\%
- Approval Rate \((\text{Affirmative} / (\text{Affirmative} + \text{Negative}))\): 89\% Must be \(\geq 66.66\%\)
- Consensus: YES
API 16TR1 History

• Comment Ballot received 304 comments
  • Duplicate comments: 83
  • Total original comments: 221
API 16TR1 New Addition

• Protocol to shear AND seal
  • Document required shear force
  • Document required seal force

• Achieved by two shears (third shear optional):
  • Test 1 - Shear with full RWP of hydraulic system, pressure test
  • Test 2 - Regulate hydraulic pressure back to the shear pressure of the first test (plus 5%), pressure test. If a seal is not successful, adjust hydraulic pressure by +200 psi increments until seal is achieved.
  • Test 3 – (Optional) Regulate hydraulic pressure to the highest of the two previous shears (plus 5%), pressure test. If a seal is not successful, adjust hydraulic pressure by +200 psi increments until seal is achieved.
API 16TR1 Path Forward

- Document submitted to API June 2017
  - 6 week Comment Ballot
  - Comment resolution complete
  - Due to technical changes will send for 2\textsuperscript{nd} ballot.
  - Publication after 2\textsuperscript{nd} ballot results