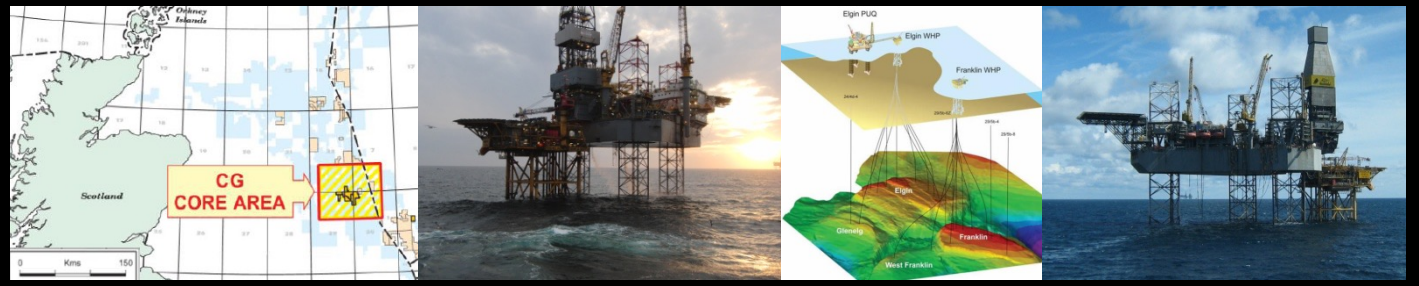
5th Element Inspection Services LLC

StopForce™
DEFENDS FROM SHOCKWAVES.

Total E&P UK – 29/5B – H2 (WFD)

CGA2 – West Franklin/Franklin Team

REX – Use of StopForce™ Safety Curtain on Rowan Gorilla V



INTRODUCTION

- **Reason Installed**
  - Two safety curtains are installed on the drill floor to isolate the standpipe manifold and the choke manifold
  - It allows high-pressure testing on those two manifolds while work is performed on the drill floor, leading to a time and cost saving

Easy Installation & Handling

- Curtains are easily installed
- Approximately 8 days to install (not including prior drawings and survey to be drafted) curtains around stand pipe and choke manifolds
- Curtains are on fixed rails so they can be opened out and extended easily and secured away when not required

SAFETY CURTAINS HAVE BEEN INSTALLED TO SAVE TIME AND MONEY WHILE NOT HINDERING NORMAL OPERATIONS

BENEFITS

- **Why Does It Save Time?**
  - The BOP test is divided into two main components:
    - The test of the BOP itself, the rams, and the valves
    - The test of the Standpipe Manifold and the Choke Manifold
      - There are more tests to perform on the manifolds than on the BOP itself
      - If tests on the BOP and manifolds could be performed in parallel, these tests would be performed during live operations
      - The manifolds are on the drill floor and under high pressure next to the rotary table where drill crews work; therefore, work around the rotary table is typically stopped during a choke manifold test (i.e. no tripping pipe)
      - The safety curtains allow operations to resume as soon as the BOP itself is entirely tested and the test string is out of the hole. This is because the choke manifold tests are performed behind the safety curtains which protect the crew on the drill floor

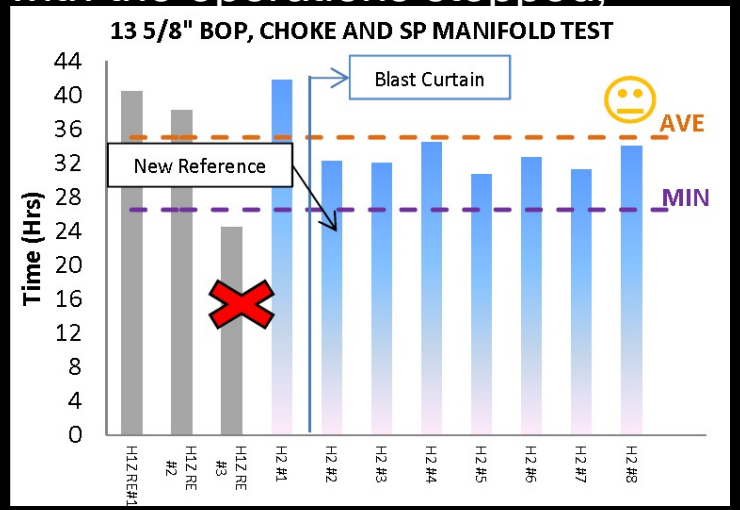
TIME IS SAVED TESTING THE MANIFOLDS WHEN THE BOP ITSELF IS FULLY TESTED

BENEFITS

- **How was the money saved determined?**
  - During 6 BOP tests performed on the Rowan Gorilla V, the time taken for the manifold tests performed behind the safety curtains whilst performing other online activity (i.e. tripping pipe) was recorded to measure the time saved by the curtain
  - Those tests would otherwise have been performed with the operations stopped, and at full rig rate.
  - Time saved was linked to rig daily cost:

$$M = T * RC / (24*60)$$

With M the money saved, T the time saved in minutes and RC the rig daily cost



THE TIME SAVED RECORDINGS LED TO THE MONEY SAVED

BENEFITS

- **Results**

The average time for a BOP test before was 40 hours

TEST DATE	TIME SAVED*	MONEY SAVED
2-11-2015	16.00 Hrs	197,000£
3-01-2015	12.25 Hrs	159,000£
3-19-2015	8.25 Hrs	96,000£
4-07-2015	13.50 Hrs	155,000£
4-27-2015	6.50 Hrs	30,000£
5-18-2015	5.75 Hrs	65,000£

duration of offline tests that would have otherwise been performed in live rig time

REAL BENEFIT AND SIGNIFICANT COST SAVINGS ACHIEVED THROUGH USE OF THE SAFETY CURTAIN

COMMENTS

Type of Test

- The time saved varies according to the efficiency of the tests performed on the BOP itself
- If those tests are long, meaning more tests are performed in parallel on the BOP and the manifolds because the test string is in the hole preventing work, less time is available to be saved as a result

Daily Rig Cost

- Money saved depends on the daily costs of operation when the BOP test was performed
- During expensive rig operations (i.e. completion) the time savings translate into a greater cost savings

Test Configuration

- The two most recent BOP tests show a particularly low amount of time saved
- This was due to 4” DP being introduced into the drill string requiring a test on the VBRs that resulted in 5”, 5-1/2” and 4” DP test assemblies being made and run
- This means more tests on the choke manifold can be captured in the BOP test itself which left fewer tests to be performed offline (i.e. less opportunity to save time)

TIME AND MONEY SAVED DEPEND WIDELY ON THE SPECIFICS OF EACH TEST

CONCLUSION

- **StopForce™ Safety Curtains having been installed on the Rowan Gorilla V around the 15K Choke Manifold and Standpipe Manifold achieved the following:**

1. The addition of the safety curtain provided increased protection of personnel during high-pressure testing through isolation of the equipment during the tests
2. Protection of the drill floor area while simultaneous productive operations (tripping pipe) and pressure testing of the Manifolds offline took place
3. An average cost savings of 117,000£ per pressure test on the RGV BOP tests (6 tests) giving a potential savings of 900,000£ on the current well (WFD) that could be realized, assuming 8 tests

Following installation on the RGV to achieve the above safety and cost benefits, it is recommended that safety curtains are installed on all jack-up units with a similar and suitable rig floor configuration

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TEST VIDEOS

https://youtu.be/XbRcjOW9ULs