



Modification 0607S - Action Update

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Action 0102: CO2 content of Norwegian Gas



Vesterled

- Information received from Gassco (presentation submitted to Workgroup)
 - Historical range in CO2 levels 1.5% - 3.5%
 - Production volumes forecast to fall rapidly over the next few years
 - Forecast CO2 levels 1.5% - 4%

Frigg System

- Martin Linge field due to start up in 2018 (<4% CO2)

Update: occurrences when St Fergus NSMP terminal CO2 limit could have been above 4mol%



- Total of 13 separate “total” outages of the Laggan Tormore fields since start up of twin compressor operation in May 2016

Double Compressor Trips at SGP since 2 Compressor Operations (May 16)			
	Date Start	Date End	Total Time (Days)
1	21/05/2016 03:00	21/05/2016 09:00	0.3
2	21/06/2016 20:50	24/06/2016 12:00	2.6
3	26/06/2016 03:00	26/06/2016 10:45	0.3
4	14/07/2016 16:30	15/07/2016 09:00	0.7
5	18/07/2016 18:10	18/07/2016 23:48	0.2
6	07/08/2016 05:32	08/08/2016 22:03	1.7
7	03/10/2016 00:00	04/10/2016 10:30	1.4
8	06/10/2016 13:18	07/10/2016 05:00	0.7
9	08/01/2017 00:51	08/01/2017 09:57	0.4
10	06/02/2017 03:09	06/02/2017 14:46	0.5
11	09/02/2017 11:17	09/02/2017 16:38	0.2
12	11/02/2017 15:04	12/02/2017 11:48	0.9
13	14/02/2017 15:37	15/02/2017 06:42	0.6

Total

10.5

Average (Days)

0.8

- Laggan Tormore blend gas unavailable 4% of the time.
- Shetland Gas Plant now has three 50% capacity compressors which provides some redundancy.

Action 0103 – duration of slugs for offspec scenarios



- High CO2 slug is dependent on the actual flow rates when LT restarts.
 - size and duration is subject to the speed of the ramp rate. If this rate is slow, there is less pressure in the pipeline, the CO2 content is lower, but the duration is longer
- BP Scenarios
 - Peak CO2 slug duration range from 10hrs (scenario 1, peak 3.65%) to 15hrs (scenario 4, peak 3.87%)
 - Assume 60 hour outage (highest of historical trips observed)
 - Assume LT ramp to full production over 6 hours
- Duration of 15hrs is considered worst case scenario.
 - Longer ramp up of LT reduces the rate at which offspec gas arrives at the NSMP terminal thereby reducing peak CO2 level.

Other Actions



- 0105 Operating Arrangements
 - BP, NSMP and National Grid NTS currently exploring whether operational procedures could be used to manage short term off spec CO2 levels as
- 0106 Other Gas Parameters
 - Feedback to be provided for next Workgroup
- 0109 OGA
 - Discussed with OGA and a statement will be provided
- 0110 Carbon Cost Assesment
 - Feedback to be provided for next Workgroup