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Gas Storage Bergermeer maintenance progression summer ’18 and winter ‘18/’19 outlook

Back in March 2018 TAQA published a Q&A letter explaining to customers and the market about the challenges and expected way forward at Gas Storage Bergermeer (GSB) in relation to the withdrawal issues and resulting technical curtailment. As stipulated in that letter, the curtailments were caused by technical challenges on both the Dew Point Correction Units (DPCUs) and the compressors.

This note aims to continue TAQA’s transparent approach to communication in relation to GSB. It will recap on both the DPCU and compressor issues, explain the maintenance progression made since and share an outlook for the coming winter months.

In summary;

- **the newly designed and fully commissioned DPCUs are ready to operate at maximum withdrawal levels;**
- **the available compressor capacity is sufficient to support maximum contractual withdrawal levels;**
- **several mitigating actions have been put in place in relation to the compressor process to prevent the historic compressor issues from reoccurring.**

For further information on the process and functionality of the DPCUs and compressors during the injection and withdrawal cycle, please refer to questions 1 – 4 in the Q&A letter.

DPCU’s

Back in March 2018, issues with the DPCUs started when one of the (two) electrical bundles in one of the (two) drying trains experienced electrical connector failures. Temporary operation of the DPCU using only one electrical bundle was attempted, offering access to half of that drying train’s capacity. However, this set-up was unsustainable and as a result GSB operated the second half of March with the withdrawal capacity of only one DPCU.

To address the DPCU issue TAQA engaged with its DPCU supplier to find a structural solution. This solution comprised a redesign of and investment in new heaters as well as the associated electrical and control components.

Today, the complete heating units have been replaced with heaters of a different design. The new heaters incorporate four smaller heating elements (instead of two larger ones) and are less tightly configured than previously. As such, they have more space around them to allow for an improved gas flow, thereby creating less risk to overheating. Another advantage of this revised set-up is that the electrical current going through the system is now spread over four entry points instead of two. The complete electrical system surrounding the heaters has also been renewed and now allows for a proportional gradual increase and decrease in capacity, instead of a simple on/off system.

This new DPCU system has been fully commissioned and is ready to operate at maximum withdrawal rates during the coming winter.

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Compressors

With respect to the performance of the compressors, GSB had four out of (a total available) six compressors running at the start of 2018. However, with the reservoir still at 60% fullness there was ample reservoir pressure to withdraw the gas without the need for compression.

With depletion of the working gas and the reservoir fullness decreasing, compression was then required to continue to deliver the high withdrawal rates, and unfortunately in the middle of February two compressors failed. Root cause analyses of these failures concluded that the electrical motors of the compressors were damaged due to a too-high concentration of liquids in the cooling gas flow within the compressor e-motor.

Two of the earlier failed compressors returned to service at the start of the season, which therefore meant that injections during summer 2018 were executed with between two and four compressors, depending on the level of nominations.

To solve the compressor issues and prevent reoccurrence of these problems, TAQA has been working closely with its compressor supplier, mainly in two specific areas: fixing and/or replacing the compressor motors, and introducing modifications in the process systems around the compressors to avoid liquid build-up in the compressor e-motors.

The fixing and replacing of compressor motors resulted in GSB now entering the upcoming withdrawal season with four new/overhauled compressor motors. The two remaining compressors will undergo their planned maintenance regime in the coming three months. TAQA also ordered a spare compressor motor to mitigate any unforeseen problems in the future and allow for a relatively quick repair should such a scenario occur.

With respect to **changing the process around the compressors** to avoid liquid build-up in the compressor machines during standstill and operation, several process improvements have been made to the valve systems surrounding the compressors, including drainage options and heat tracing which will avoid temperature drops and the possibility of liquid drop-outs.

TAQA is confident that because of these improvements and

1. maximum withdrawals do not require compression until the reservoir is about 60% empty,
2. subsequent withdrawal nominations that need compression can be met with two to four compressors,
3. a fifth compressor is expected to come back before the tail end of the withdrawal season,

maximum withdrawal can be effectively supported during the upcoming winter season and the subsequent summer injection season can be operated as designed, with five compressors in operation and allowing continuous flexible maintenance of one compressor**.**

GSB continues to publish technical unavailability as per REMIT obligations at GIE. Technical unavailabilities do not necessarily equate to contractual availabilities. In other words, during a technical unavailability as published on the AGSI+ website, GSB can opt to either keep customers whole or (partly) curtail contractually.