

IS/18  
dated --.---.2018

### **Analysis of Operation of Dry Gas Seals (DGS) for T-JET 70-4 Compressor**

In response to your letter about the need to analyze the operation, let me inform you that the operating trends of GBC-A DGS (dry gas seals of gas booster compressor GBC-A) have been analyzed using the archive data upload. Taking into account that the actual approved setpoint chart was not submitted, the analysis of DGS operation was performed on the basis of current readings, factory documentation and operating parameters of single-type equipment.

Analysis of GBC-A DGS operation was performed according to the archive data for the period of --.---.18 thru --.---.18.

GBC-A operation showed the following deviations in DGS functioning:

1. During the period of GBC-A operation from June to August, the leakage pressure decreased downstream of the 4th stage (~ 410 kPa in June, ~ 370 kPa in August), which indicates a decrease in sealing gas flow rate through the seals. Most likely, the leakage pressure decreased due to a decrease in the pressure of the secondary sealing gas (from ~ 423 kPa in June to ~ 372 kPa in August). Since the pressure of the secondary sealing gas on the rest of stages remained at the same level and differential pressure on the seals remained unchanged, it can be assumed that the problem is most likely in a throttle washer.

2. A low pressure difference was noted at the seals of the stages. According to the factory documentation, pre-alarm setpoint for reduced pressure difference is 130 kPa. The difference is measured upstream of the throttle washer, so the real difference shall be even smaller. The difference at the 4th stage is 126 kPa. For satisfactory seal operation (establishing flow through the seals), the actual pressure difference at the seals (between the secondary sealing gas and the leakage) should be 25-35 kPa.

3. Compressed air flow towards the seals is at the level of 4.7-4.8 m<sup>3</sup>/h, which is lower than the factory setting (5 m<sup>3</sup>/h), reduced air flow leads to deterioration of gas seal insulation from the bearing chambers and prevents oil ingress.

In our opinion, the pressure of the primary sealing gas on DGS is not sufficient for the proper operation of the seals. With the existing primary sealing gas pressure, it is highly probable that unrefined process gas will enter the sealing labyrinth or, what is worse, a stagnation zone may appear, thereby reducing the seals lifetime.

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on Compressor Equipment

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