



**5,000 Volt AC Leakage Test Report  
2-1/16" API 10K**

**For Vniigaz/Astrakhan Gazprom GPU**

**June 13, 2003**

## Introduction

On June 9, 2003, Pikotek conducted a 5,000 volt AC leakage test on an API 2-1/16" – 10K flange assembly using the following components/materials:

2 each carbon steel API 2-1/16" – 10K flanges (sandblasted to remove any paint and/or coating).

8 each bare 3/4" carbon steel stud bolts (ASTM grade B7).

16 each bare carbon steel nuts (ASTM grade H2).

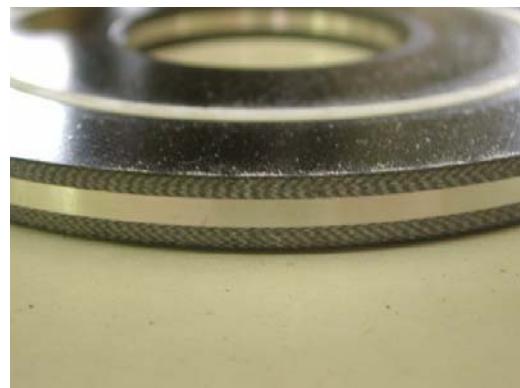
1 each VCS insulating gasket with 316 ss core and 0.093 per side of G-10 insulating material (0.308" total gasket thickness). One spring-energized Teflon seal per side located outside of the ring joint groove.

8 each G-10 insulating sleeves.

16 each G-10 insulating washers.

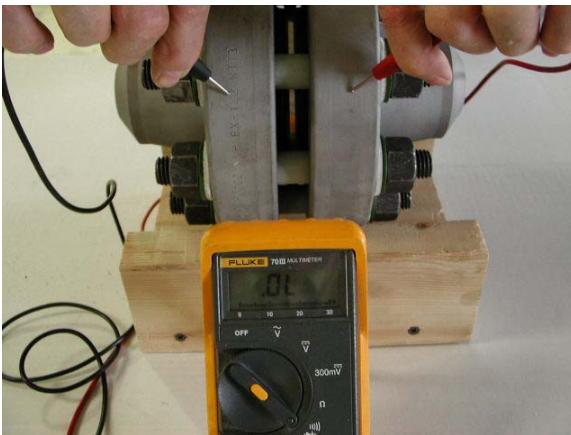
16 each Teflon coated mild carbon steel metal washers.

The purpose of this test was to examine the functionality of the new insulating gasket design for Gazprom following unsuccessful tests conducted in the field.



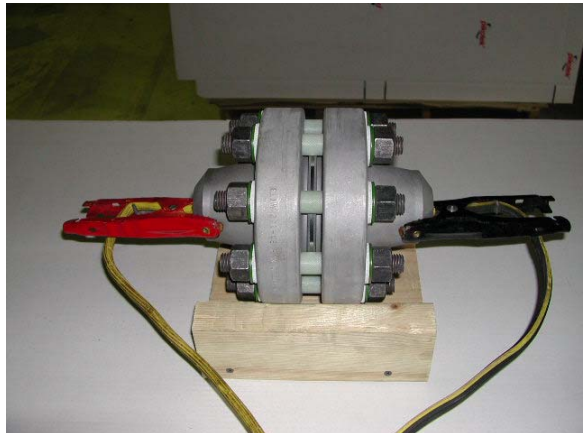
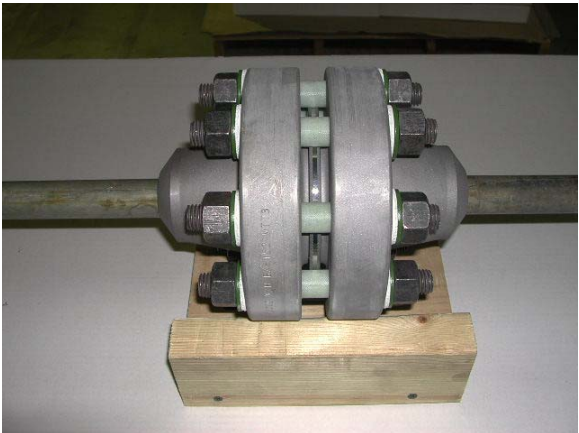
## Testing

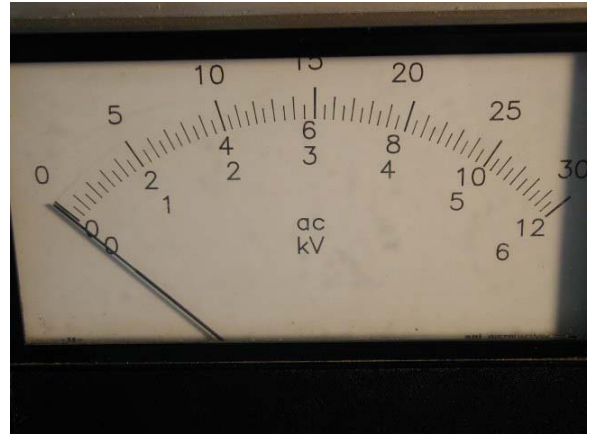
Following assembly and make-up to the prescribed bolt torque, the flanges were then checked for electrical continuity using a Fluke multi-meter. The result of this test showed that no continuity was present and that the flanges were insulated to a reading of .OL (infinite resistivity).



Once the flanges were assembled and tested for electrical isolation, the AC voltage regulator was then hooked up to the ends of the flanges. The machine used to carry out the AC leakage test was a Hipotronics Model HIP-730-2 which is described as a 30kV AC UL Hipot capable of generating up to 30 kVA of voltage (see calibration certificate attached).

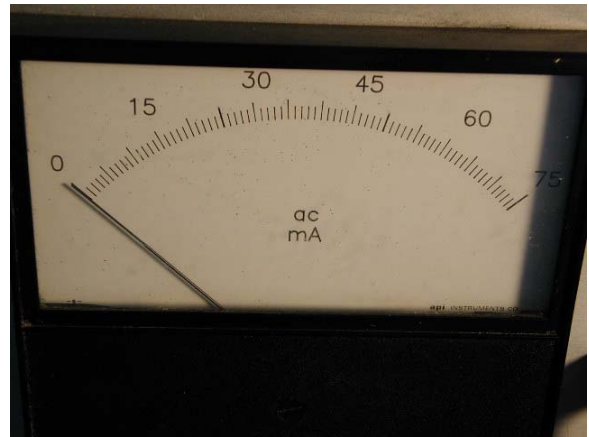
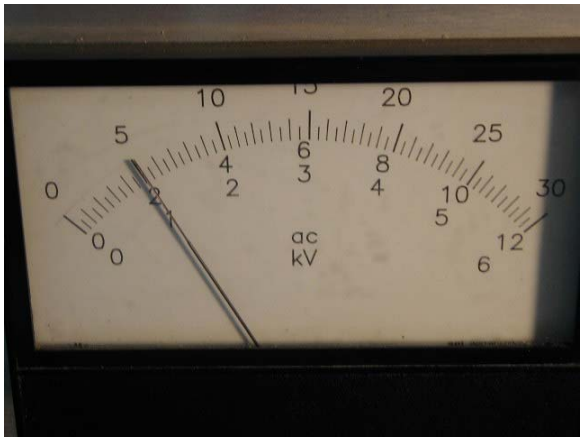




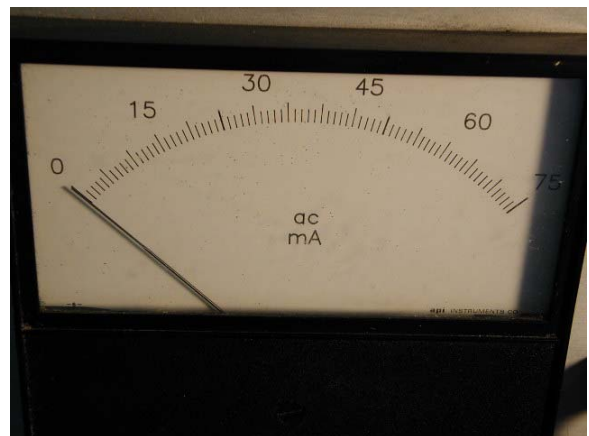
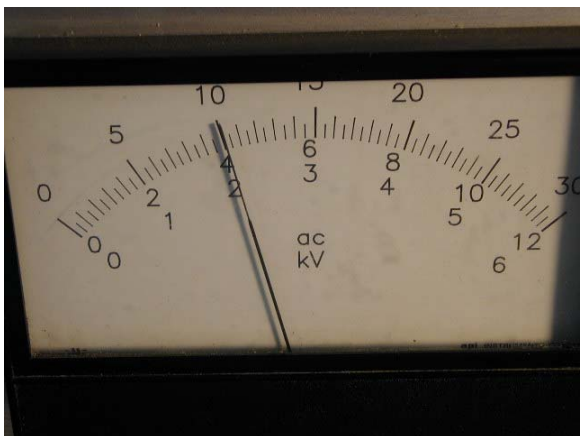


### AC Leakage Testing

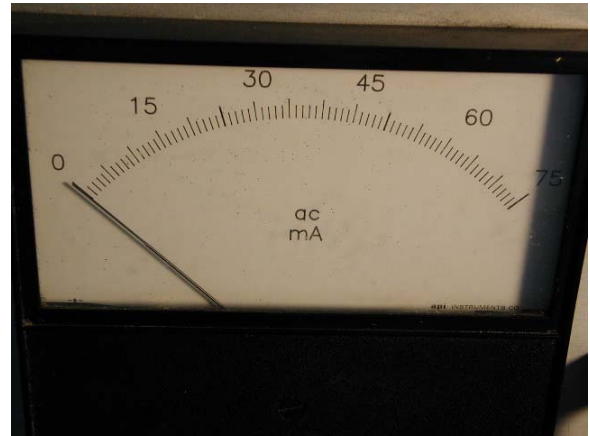
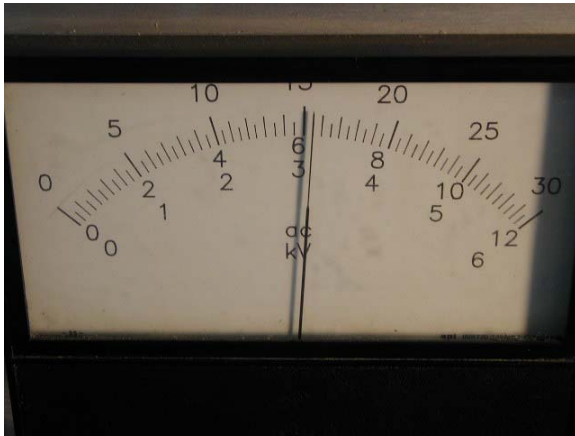
The machine was powered up and the voltage was increased from 0 to 1,000 volts AC (60 mhz) and held for a period of 1 minute with no amperage (mA) current leakage.



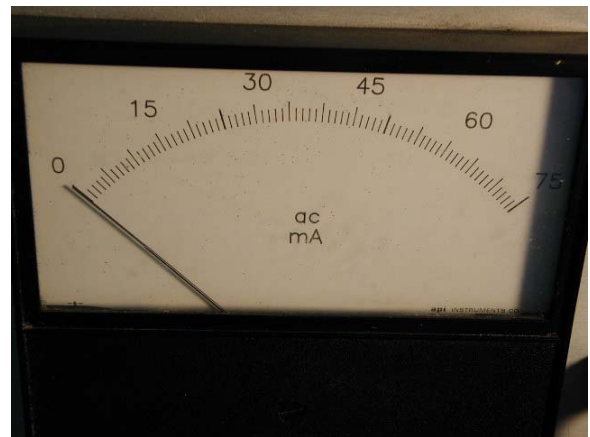
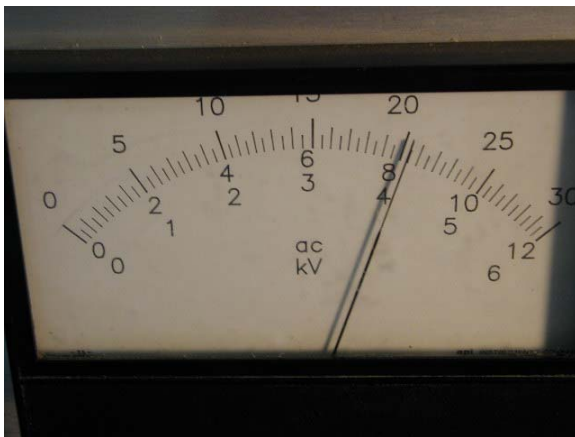
Following the 1 minute hold at 1,000 VAC, the voltage was then turned up to 2,000 volts AC and held for a period or 1 minute with again no current leakage.



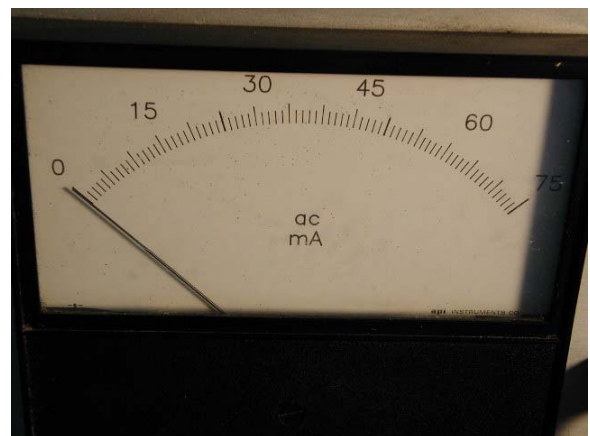
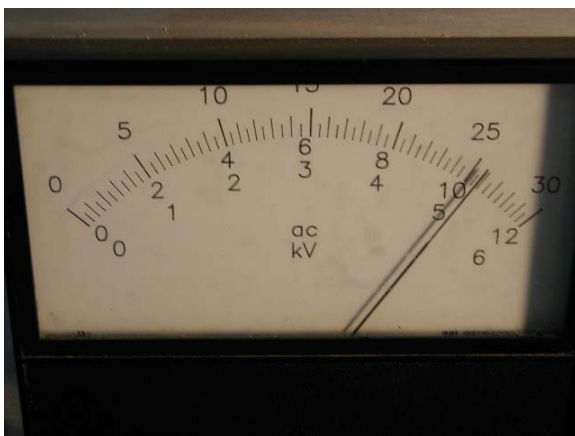
Following the 1 minute hold at 2,000 VAC, the voltage was then turned up to 3,000 volts AC and held for a period of 1 minute with again no current leakage.



Following the 1 minute hold at 3,000 VAC, the voltage was then turned up to 4,000 volts AC and held for a period of 1 minute with again no current leakage.



Following the 1 minute hold at 4,000 VAC, the voltage was then turned up to 5,000 volts AC and held for a period of 1 minute with again no current leakage.



## Conclusion

The electrical tests were all conducted in a shop environment with app. 85% relative humidity in the building and at app. 72 degrees F ambient temperature. The equipment was all calibrated and in good working condition.



The tests were all successful and passed.