Pressure testing of Line 1 was begun following completion. Pressure testing is quite a complex procedure, and the planning has been taking place over the past few years. We assessed various options for handling this procedure before deciding on the path we have taken. This has led to many issues, including scheduling, environmental safety, water quality, and vessel availability.

What were some of the primary challenges you faced regarding scheduling? 

MC: Pressure testing has three stages. First, the pipeline is flushed with seawater and de-oxygenated seawater that has been treated with ultraviolet light in order to ensure that it is free of bacteria. Flooding of the pipeline also removes any debris left during construction and welding. At the same time, pipeline inspection gauges (PIGs) travel through the pipeline to check its condition and adherence to specifications. As the PIGs travel through the pipeline, they also clean it. Finally, the pipeline is pressurized beyond the planned maximum operating pressure of the pipelines for a minimum of 24 hours. If we can withstand this higher pressure, then the pipeline is confirmed to be leak-free and capable of transporting gas at the operating pressure.

Who confirms that the pressure tests have been performed perfectly? 

MC: The need is required by international codes and authorities. All stages are overseen by a notified body. In this case, it is DNV (Det Norske Veritas), a leading independent company that certifies the Nord Stream Pipeline. These stages are internationally recognized industry standards, and DNV inspects and certifies that all aspects of the test are conducted according to the industry rules.

Is risk management an important part of the planning process? 

MC: Yes, risk management is an integral part of the planning process. Risk analysis is performed at the beginning of the project to identify potential risks and develop strategies to mitigate them. Risk management continues throughout the project, with ongoing monitoring and adjustments as necessary.

Why is pressure testing so important? 

MC: Pressure testing is carried out to confirm the overall integrity and safety of the pipeline. It is a critical step in ensuring that the pipeline is capable of safely transporting gas at the operating pressure and that it meets all safety and regulatory requirements. The results of the pressure test are used to confirm the pipeline's structural integrity and to identify any potential defects that need to be addressed before the pipeline is put into service.
Nord Stream Pressure Testing

Flooding, Pressure Testing, Dewatering & Drying

Step 1: Flooding of Section Two
Pressure testing of Line 1 starts at KP 297. Untreated seawater is pumped into this section. The PIGs, or pipeline inspection gauges, are launched and travel 200 bar. After the process of PIG launching and flooding of the pipeline section, the water is pressurised in the pipeline segment.

Step 2: Flooding Section One
After section two has been flooded, drained and gauged, it is moved to KP 1,224, where the process of PIG launching and flooding of section one takes place. At the same time, the water pressure increases. The test pressure is higher than the operating pressure.

Step 3: Pressurising Section One
Monitoring of the pressurisation will take place from the German landfall. The section must withstand the test pressure for at least 24 hours to prove that the pipeline can withstand the water pressure. The water pressure will then be reduced to KP 297 for two weeks.

Step 4: Pressurising Section Three
Once sections one and two have been tested, the Far Samson moves to KP 1,224 to flood, drain and gauge section three. Pressurisation and monitoring of this section is performed from the German landfall. Meanwhile, sections one and two will be connected underwater.

Step 5: Dewatering and Drying
After all three sections of the pipelines have been flooded, cleaned and gauged, a task of dewatering and drying takes place. The water will be drained from the pipelines prior to subsequent drying.

The PIG Launcher
The PIG launchers are specially designed to clean the inside of the pipelines. They house the PIGs that will clean, gauge and funnel the sections prior to pressurisation. The water introduced into the pipelines, is filtered and de-oxygenated. It is also treated with ultraviolet light so that it is bacteria-free.

Pressure Testing at Kilometre Point 297
The ends of the two sections of Line 1 meet on the seabed 297 kilometres from the start of the route in Portovaya Bay, Russia. The first section, from kilometre point (KP) 0 to KP 297, is designed for an operational pressure of up to 220 bar. The second section, from KP 297 to KP 675, is designed for 250 bar. Therefore, the sections are tested separately at twice their maximum operating pressure. Following pressure testing, the two segments will be welded together underwater. The same testing procedure is applied to section three, which will then be connected at KP 675.

For further details of Nord Stream Pipelines visit: www.nord-stream.com.