

BACKGROUND INFORMATION

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Nord Stream and Cultural Heritage

Surveys and Preservation of Underwater Cultural Remains of Archaeological Value

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1. Introduction

Nord Stream is a natural gas pipeline that connects the Russian Baltic Sea coast from Portovaya Bay, near the town of Vyborg, with the German Baltic Sea coast at Lubmin near Greifswald. It is being built by Nord Stream AG, an international consortium whose shareholders are OAO Gazprom, BASF/Wintershall Holding GmbH, E.ON Ruhrgas AG, N.V. Nederlandse Gasunie and GDF Suez S.A. It is planned that the first of two parallel pipelines will be operational in the fourth quarter of 2011. Each line is approximately 1,220 kilometres long, providing a transport capacity of some 27.5 billion cubic metres (bcm) per year. Nord Stream's full annual capacity of about 55 bcm will be reached when the second line goes on stream. This will be enough gas to supply more than 26 million European households.

When planning the large-scale construction project that is Nord Stream, it was of major importance for the company to pay attention to the effect that the project might have on cultural heritage – objects that represent evidence of past and present human activity. Nord Stream is aware that the cultural heritage resources of the Baltic Sea are finite, and it takes its obligations to handle them responsibly very seriously. In the five countries whose waters the pipeline traverses, cultural heritage is protected by legislation, and the authorities have developed procedures to avoid impacts on cultural heritage from construction projects.

1.1. Nord Stream's Approach to Cultural Heritage

Nord Stream has taken all due care to use the most advanced technology and have experienced archaeological expertise at its disposal to manage this sensitive issue. Through extensive examinations, Nord Stream has ensured that the detailed knowledge and information has been gathered to locate known, previously unknown and potential cultural heritage sites in the Baltic Sea. Nord Stream planned the pipeline route to avoid these sites and is cooperating with all responsible national and international authorities to ensure its activities are appropriate and do not have more than a minimal impact on cultural heritage.

Several measures have been developed in order to avoid any contact with cultural heritage objects during the construction phase. To avoid disturbance of cultural heritage sites by anchoring, special measures have been developed, for example using a dynamically positioned pipelay vessel (i.e. a vessel without an anchor) and establishing restriction zones around cultural heritage sites as well as specific anchor patterns where an anchored pipelay vessel is working.

Due to physical conditions in the Baltic Sea, the preservation of organic materials is exceptional, even on an international scale. The preservation value and scientific potential of underwater cultural remains are therefore great. The fact that the underwater cultural environment has been exempt from much of the exploitation that has taken place on land only adds to the potential archaeological value of the underwater cultural remains in the Baltic Sea.

1.2. Underwater Cultural Remains

The maritime cultural heritage in the Baltic Sea primarily consists of two broad categories of underwater sites: shipwrecks and submerged settlements and landscapes.

Shipwrecks

There are known to be a large number of shipwrecks on the seabed of the Baltic Sea. Shipwreck sites reflect a diverse group of vessels that vary in age, size and type. Some shipwrecks are of no archaeological interest, whereas others are unique due to their construction method, the degree of their preservation or special historical factors.

Once settled on the seabed, the wrecks are prone to physical destruction by activities like trawling. Still, a shipwreck must not necessarily be fully intact to be of archaeological interest. Even some highly degraded shipwrecks can yield valuable information after thorough investigations of hull remains, equipment, cargo and other artefacts belonging to the wreck. It is therefore important to recognise that the "ancient monument area" of a wreck site is not only the hull itself, but also includes the total deposit and distribution area of remains from a broken wreck, which in many cases is substantially larger than the actual hull.

Submerged Settlements and Landscapes

The coastline of the Baltic Sea has changed significantly since the last ice age. Global warming at the end of the last glacial period led to rising sea levels, which, combined with isostatic movement of land masses, caused great changes to the coastline of the Baltic. Changing sea levels caused some former land areas to be submerged (particularly in the southern part of the Baltic Sea). This land contained

human settlements, monuments and the landscapes that surrounded them. In many cases, their remains have been preserved far better than those of sites on land. Organic materials, in particular, may be preserved in a fine state. Therefore, these remains represent a unique opportunity to gain knowledge about former ways of life.

1.3. Investigations into Cultural Heritage in the Baltic Sea

As part of the planning process for the pipeline, Nord Stream has carried out a comprehensive investigation of cultural heritage by assessing previously published information, evaluating earlier seabed surveys, carrying out detailed surveys of the seabed and consulting closely with the responsible authorities and other organisations.

Detailed surveys were carried out to locate a route for the pipeline that has as little impact on the environment as possible, e.g. by minimising works on the seabed. Cultural heritage sites are being avoided wherever possible.

Nord Stream's surveys entailed mapping and imaging the seabed along the pipeline's route using Remotely Operated Vehicles (ROVs) with cameras for visual inspection, side-scan sonar systems, as well as a gradiometer for the detection of ferrous objects. Before pipe laying, an additional pre-lay survey of the seabed is conducted in order to ensure that nothing has changed in the installation corridor since previous surveys and that it is free of any obstructions.

2. Cultural Heritage Finds Along the Nord Stream Route

2.1. Russian Sector

A total of 17 wrecks have been located. Two are within 50 metres of the pipeline route, while the others are further away. Some of the wrecks are vessels made of wood and some of metal. The survey data was evaluated by the Institute of Material Culture History of the Russian Academy of Sciences.

In July 2010, Nord Stream salvaged two admiralty anchors from the seabed that were found within the installation corridor in Russian waters. The salvaged anchors date back to the 18th to 19th centuries, and have been delivered to the Historical Architectural Museum of Kronshtadt for study, preservation, and storage.



Figure 1: Footage of one of the wrecks in Russian waters: Visual inspection and side scan sonar image.

2.2. Finnish Sector

A number of wrecks or possible wrecks have been identified along the pipeline route from archival sources and surveys. The types of wrecks range widely and include an aircraft and several wooden sailing vessels of varying ages. The archaeological significance of the wrecks has been assessed by the Finnish National Board of Antiquities (FNBA).

Six wrecks or possible wrecks have been found within 50 metres of the pipeline route. Within the anchor corridor, an additional 13 wrecks have been found. In the anchoring corridor from kilometre point (KP) 1 350 westwards, four wrecks have been determined to have cultural heritage value and anchor patterns were designed to avoid them.

The pipeline route is about 7.5 kilometres from the protected area around the wreck site of the passenger ferry Estonia, which sank in 1994.

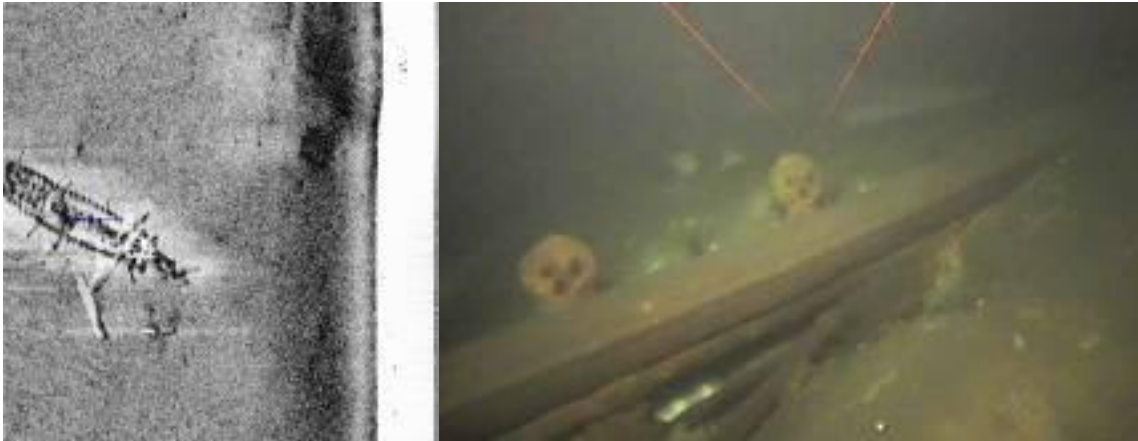


Figure 2: Side scan sonar and visual inspection image of wreck site in Finnish EEZ discovered during survey. The dead eyes (part of the rigging) are still in place.

2.3. Swedish Sector

During the extensive seabed surveys conducted as part of the preparatory works ahead of pipeline construction, 12 shipwrecks were discovered in a corridor next to the pipeline route in the Swedish Exclusive Economic Zone (EEZ). The findings are located in the anchor corridor. Analyses so far indicate that at least 9 of the 12 findings are of great cultural historical value, and thus also well preserved according to the Swedish National Heritage Board. Most of them are commercial ships, originating from the 18th and 19th centuries. However, the most ancient wreck could be from the Middle Ages.

During the Mesolithic Age (Older Stone Age from 8,000-4,200 BC), parts of the Södra Midsjöbanken, located south of Öland and Gotland, were land areas. It is therefore possible that there may be remains of settlements and/or seasonal hunting stations in these now submerged areas.

¹ For easy orientation and identification of locations along its route, Nord Stream has introduced kilometre points (KP). Counting starts at Portovaya Bay with KP 0 and ends in Lubmin with KP 1224.

According to the Swedish National Heritage Board (Riksantikvarieämbetet, RAA), the coastline of Blekinge (approximately 75 kilometres west of the pipeline route) was some 20 metres lower 10,000 years ago. It is therefore likely that submerged Stone Age settlements are present in water depths of 20 metres or less. However, it cannot be ruled out that submerged settlements could be encountered in slightly deeper waters, as sea level changes in the Baltic Sea have not been uniform.

The pipeline route crosses the southernmost part of Hoburgsbanken just between Nordra and Södra Midsjöbanken in water depths of more than 20 metres. According to survey information, the sea bottom in the area where the pipeline route crosses between Norra and Södra Midsjöbanken (water depth 25-45 metres) consists primarily of glacial till and bedrock. The possibility of encountering in situ remnants of Stone Age settlements is very slim, as these areas have most likely undergone some degree of erosion since submerging. The composition of the seafloor also makes an embedding of settlement layers impossible.

2.4. Danish Sector

The Viking Ship Museum has assessed the anchor corridor survey data and delivered an assessment report, which stated that 41 of the objects encountered are protected by the Danish Museum Act. Detailed plans for the individual objects are being established in a dialogue with the Viking Ship Museum.

A historic rudder was found near the island of Bornholm during the surveys for the Nord Stream Pipeline. The 8 metre long wooden item is estimated to be from the 17th or 18th century and thus protected by the Danish cultural heritage legislation. It was lifted in September 2009 and sent for preservation to the National Museum near Copenhagen in order to safeguard the rudder against potentially being damaged during construction works. The rudder is planned to be displayed in the new building of the Danish Maritime Museum in Elsinore once it is ready.

In areas around Bornholm, no submerged settlement sites are registered in the cultural heritage records and no indications of submerged settlement sites were identified during the survey operations in the Danish section of the pipeline routes. However, ancient submerged forests have for many years been encountered by fishermen. While these have little heritage value in themselves, the stumps of submerged trees can sometimes be dated, providing valuable information about changes in sea levels in the area throughout history.



Figure 3: In September 2009, employees of the Viking Ship Museum and the National Museum salvaged a historic rudder near the island of Bornholm.

2.5. German Sector

The pipeline route passes through the Bay of Greifswald, close to the German coast, where 20 ships were sunk during the Great Nordic War (1700–1721) to prevent enemy ships from entering the bay. The wrecks are historically important and represent a rich source of information on maritime technology at the beginning of the 18th century.

The pipeline crosses the line of ships in such a way that the controlled removal of one of the smaller wrecks was sufficient to create a corridor approximately 60 metres wide for laying the pipeline. Archaeological documentation and investigation of the wreck was carried out during late autumn of 2008 and winter of 2009. The work was managed by the Mecklenburg-Western Pomerania Office for Culture and Care of Monuments (Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern, LaKD M-V). Remnants of the wreck were located in a find spot 9 metres long and 3 metres wide. More than 50 individual parts were identified and salvaged in July and August 2009.

In 2010, two further wrecks were located during final examinations of the trenching area ahead of pipe laying. The wrecks were also examined by the LaKD M-V. The first wreck found in the Bay of Greifswald was identified as the remnants of a smaller cargo vessel. A fire on board led to the vessel's sinking and destroyed or damaged most parts, including the hull and stern that were found. After evaluating and documenting the wreck in June 2010, its remnants were relocated approximately 100 metres away and buried one metre beneath the seabed to preserve them from destruction. In June 2010, Nord Stream found the remnants of an additional shipwreck from the late Middle Ages/early modern era (circa 1400-1600 A.D.) close to the end of the Bay. The LaKD M-V classified the find as being "of supra-regional importance." The cargo in particular, which consisted of roughly 65 copper plates and several wooden barrels, provides important insight into the trade relationships in the Baltic region during that era.

Closer to the landfall site of the pipelines near Lubmin, a wreck was located approximately 100 metres away from the pipeline route. The BSH (Bundesamt für Seeschifffahrt und Hydrographie) has several records of underwater obstacles – which may be wrecks or other obstructions – in the area. None of the recorded objects are closer than 400 metres to the pipeline route.

The Agency for Preservation of Monuments of the State of Mecklenburg-Western Pomerania has been carrying out diving investigations of potential submerged Stone Age settlement sites in this area. The results of these investigations show that no sites remained undiscovered by previous surveys.



Figure 4: Left: Side scan sonar image of wreck near Lubmin and Right: Remnants of a 300 year old wreck in the Bay of Greifswald salvaged in July 2009

3. Nord Stream Commitment

3.1. Heritage Underwater Maritime Archaeology (HUMA)

Nord Stream sponsors the preservation of the Baltic Sea’s fascinating cultural heritage and its unique ecosystem through its funding of an international research project: Heritage Underwater – Maritime Archaeology (HUMA). The project focuses on the exploration and documentation of wrecks of the Danish-Lübeckish fleet, which sank near the island of Gotland, Sweden in the middle of the Baltic Sea during the Nordic Seven Years’ War in the 16th century.

The project was initiated, and is led by, AquaArkeologen, a Gotland-based maritime archaeological company. The aim of the project is to research and preserve the vulnerable cultural heritage. HUMA demonstrates that the seabed around Gotland is rich in artefacts and wrecks, only a few of which have been explored. Historical sources from the last 250 years point out that more than 2,500 ships sank along the coast of Gotland, and to date only a few of them have been found.



Figure 5: A steering wheel and a galleon from a wreck probably dating back to 1800.

3.2. Sponsorship of research, scientific and cultural projects

From the beginning, Nord Stream has worked closely with experts in order to preserve the cultural heritage of the Baltic Sea. Scientists and researchers have provided expertise to make sure that objects of archaeological value will not be damaged during construction of the pipeline, or can be salvaged.

Nord Stream actively works towards a preservation of the knowledge surrounding the Baltic Sea's cultural heritage and passing it on to future generations. The consortium provides financial support for research and teaching at the University of Helsinki which offers courses on maritime history and underwater archaeology.

Objects that have been salvaged in the course of construction of the pipeline are presented to the public in museums, too. Nord Stream cooperated with the Danish National Museum, the Viking Ship Museum in Roskilde (Denmark) and the County Museum Gotland (Sweden) and supported a number of exhibitions financially. The County Museum Gotland displayed objects salvaged by the HUMA project. The Viking Ship Museum informed the public in an interactive show about the objects of archaeological value from the Baltic Sea that have been recovered and preserved.

For Nord Stream, the commitment to archaeological, scientific and research projects provides an opportunity to demonstrate the company's responsible approach to underwater research. It is an opportunity to keep the knowledge about the Baltic Sea's heritage alive.

[Cultural heritage photos](#) and more information can be found at www.nord-stream.com.

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