

The Customer:

# THE FINNISH ENVIRONMENTAL INSTITUTE (SYKE)

The Finnish Environment Institute (SYKE) established in 1995, is a research and scientific organization, that studies phenomena related to environmental changes and develops solutions to control such changes.



## THE BACKGROUND

The Finnish Environment Institute (SYKE) established in 1995, is a research and scientific organization, that studies phenomena related to environmental changes and develops solutions to control such changes. SYKE, operating under the Ministry of Environment, is the official government pollution response authority in Finland in charge of measures regarding pollution incidents at open sea and other hazardous incidents. The Environmental Damage Division at SYKE is responsible for issues associated with the prevention of and response to environmental damages, and it will engage its cooperation partners – the Defensive Forces, the Navy, the Border Guard of Finland and the State Shipping Enterprise – as required.

## THE CHALLENGE

The oil transportation in the Gulf of Finland has increased from 22 Million tons in 1996 to 130 Million tons in 2005. Additionally the volume of other cargo traffic in the Gulf has grown significantly. For all environmental damages at sea, oil damage prevention plays the most important role due to the frequency of oil spills. However, less oil pollution has occurred in the Baltic Sea and the Gulf of Finland compared to the amount of traffic based on average incident numbers globally. In 2005, SYKE got 15 alerts for a possible oil spill threat at sea. In six of these cases, oil prevention vessels were sent to study the damage and to determine if oil had actually leaked to the sea.

Due to the sensitive ecology of the Baltic Sea, it has been internationally agreed in the Helsinki Convention that the oil combat policy of Baltic Sea countries is based on mechanical recovery of oil. The Helsinki Convention allows the use of chemicals only with very strict limitations.

Airborne surveillance helps the vessels to find the location

where the oil slick is thickest, so that as much oil as possible can be collected from the sea and to minimize the amount of oil that will reach the shores. All the Finnish oil recovery vessels are furnished with fixed brush equipment and sweeping arms that can be used for collecting oil from the sea to the container on the vessel.



**Oil recovery vessel Hylje (“Seal”) and two Navy boats, which trail the boom behind them to isolate the damage area. The seiner boats are equipped with Xplore’s iX104C2 Tablet PCs for routing purposes.**

**The purpose of the seine is to isolate and collect the oil to a thicker mass, so that it can be collected from the sea with the brush equipment to the oil recovery vessel.**

## THE SOLUTION

As the oil recovery vessel alone can collect the oil from a maximum area of 40 m width, two smaller boats are often used to trail behind a floating boom, when the width of the oil collection area can be increased to 100-150 m. These boats are equipped with mobile computers used for navigation and communication with the main vessel. The oil recovery vessel sends the route details for both boats. In 2006, SYKE replaced its earlier computing systems with Xplore’s rugged iX104C2

Tablet PCs, which are ideal for use with SYKE's Navipac software thanks to the Windows XP Tablet PC operating system and fast data processing capabilities. The true mobility - the ease to move the Tablet PCs from one boat to another - is crucial, as any boat with a powerful engine can be used to trail the boom. Therefore, in emergency situations, the systems must be easy to deploy.

"In the conditions where we operate at sea, the sealing and ruggedness of the computer is very important", says inspector Heli Haapasaari from the Environmental Damages Division of SYKE at the oil spill exercise at Hylje vessel and continues: "Additionally the reliability of the computers in the varying temperatures that we experience in the North-European climate is essential." Xplore's iX104C2 Tablet PC is tested to military standards (MIL-STD810F) to survive challenging



**The actual oil response vessel sends the route to the Tablet PCs on boats, who isolate the spill area with the boom.**

external conditions such as changes in operating temperature (-20°C...+60°C), humidity, shock and vibration. The tablets SYKE uses are equipped with Xplore's outdoor viewable AllVue display option, which allows readability in varying lighting conditions such as in direct sunlight. SYKE has connected an external dGPS device to the tablet for navigation purpose and a VHF-modem for data transfer. With the Navipac software, the boats trailing the boom follow the route that is defined and sent to them to the Tablet PCs by the primary oil damage prevention vessel, to isolate the polluted area with the floating boom. After the area is isolated, the actual collection of the oil can be started. The recovery capacity depends - among other things - on the thickness and viscosity of the oil layer

and of the recovery vessel's speed. For example the Hylje vessel can collect approximately 800 m<sup>3</sup> of oil with her brush equipment located on the sides of the vessel. Not at open sea but in other conditions, oil can be collected with so called Oil Recovery Bucket by adhering the oil to stiff rotating brushes of the equipment. As the drum rotates, the oil is swept from the brushes and the oil enters the bucket. A screw pump transfers the oil to recovery tanks.



**In winter, booms are not typically used, but the ice itself functions as a boom and isolates the damage area.**

## THE BENEFITS

Xplore's fully rugged and mobile Tablet PCs are an ideal solution to oil damage prevention vessels. The Tablet PC form factor is easy to use, with its active inductive digitizer and stylus without a keyboard or mouse when the space is limited. Regarding technical features, the iX104C2 Tablet PC is an advanced and powerful computer. One of the recent large scale oil damages at sea, where SYKE participated, is the sinking of the cargo ship Runner IV close to Estonian waters in March, 2006. Three oil spill response vessels from Finland were at the incident location for several days. In tanker accidents the biggest environmental threat is caused by the damage to the ship's tank. "Often oil damages at sea are actually caused by accidents to regular cargo ships - not to tankers - when the ships' own fuel is released into the sea", Haapasaari clarifies. For SYKE, the major benefit of deploying the Xplore tablets is the ability to use their software in harsh conditions due to the tablets' full compatibility with SYKE's software.