DNV·GL

MARITIME

THE IRIS INSPECTION SYSTEM

A cooperation between DNV GL and DLR, the German national aeronautics and space research centre, to develop an indoor tracking solution for maritime inspections.

Background

Today, digital photos play an important role for documenting the condition of the hull structure. Often, a large number of photos are taken, but it is difficult to decide later which structural part they actually show. Only if position information is added manually can they be used effectively for further follow-up or monitoring activities. An automated positioning of the photo within a structural model of the vessel would resolve this problem without increasing effort. Automated positioning through GPS, for example, is standard outdoors but cannot be applied within tanks due to the lack of a satellite connection. Indoor positioning could close that gap and allow for the automated positioning of inspection items such as photos.

DNV GL contribution

Within this project, an inspection system was developed which enriches photos with positioning data based on an existing 3D model of a vessel designed for the purpose of hull condition monitoring. The developed prototype is composed of a hardware system capable of determining the 3D coordinates of a photo and a software system assigning this photo to the 3D model. While DLR has developed the indoor tracking hardware system, DNV GL has developed the processing of the photos as part of our ShipManager Hull hull integrity software.
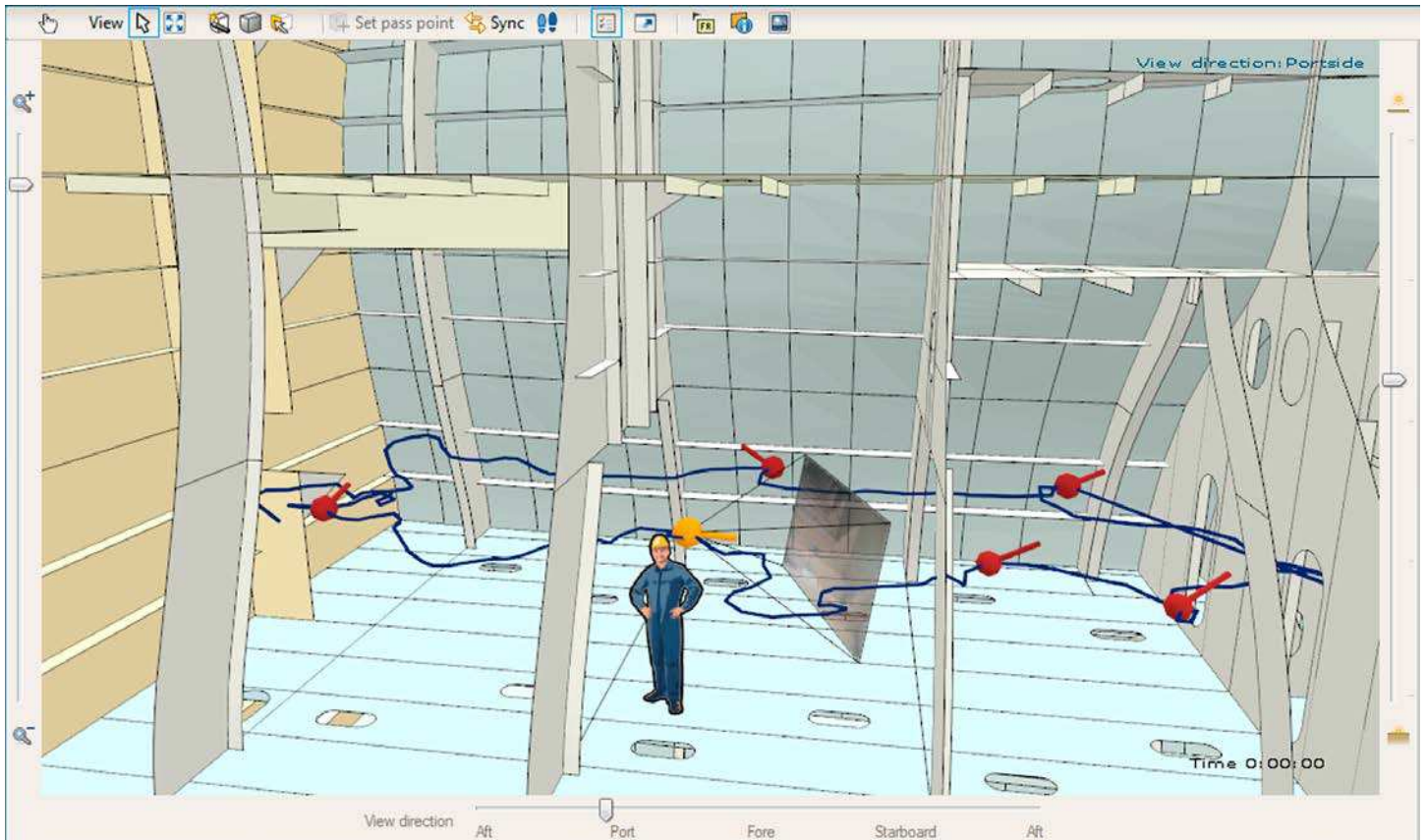
Using tracking information for advanced hull integrity management based on a 3D model of the hull structure
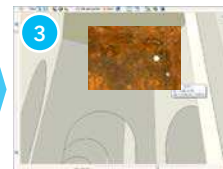
THE USAGE SCENARIO

1 Inspect the hull where a deficiency has been found.

2 Define the centre of the image using the laser marker and release the shutter to take the photo.

3 The photo is automatically positioned in the 3D model.

Challenging requirements

Indoor positioning itself is a hot topic and a challenging task. Currently, many organizations are working to solve this challenge. When developing a system for maritime inspection purposes that use indoor positioning capabilities, several requirements had to be considered. These included operability in confined, dark and dirty spaces, and the use of existing low-price components.

Project results

Before starting the project, DLR had already developed a hardware system for indoor positioning based on optical and inertial sensors capable of autonomous positioning. In other words, the system did not require pre-installed signal emitters. Still, the system was too large for a hands-free operation and also not designed for harsh environments. It therefore had to be redesigned to meet maritime requirements. Besides the

positioning-only system, it was essential to have a hull integrity software system in place which is capable of dealing with the located inspection results. Here, the DNV GL ShipManager Hull, a hullintegrity management platform based on a 3D model, was extended accordingly. These two major components – DLR's system and DNV GL's software – have demonstrated how maritime inspection could be taken to a new level of information management.

CONTACT

Marc Wilken
Information Management R&D
marc.wilken@dnvgl.com