Duct Installation

Methodology

The idea behind the usage of Terrestrial Laser Scanning Technology in a duct installation is the measurement assisted erection for direct and accurate material reduction (duct). This means that both the duct and the ship stern are scanned in order to create 3D models. The next demanding task is the intersection of the previously created models in 3D space. In this stage, probable differences of the as build construction to the design can be revealed. Since a successful intersection (duct with the ship stern) has achieved, characteristic points are stored in order to be staked out on the objects of interest. The final step requires the usage of a Leica high precision Total Station and marking of cutting - welding points on the duct and on the ship stern.

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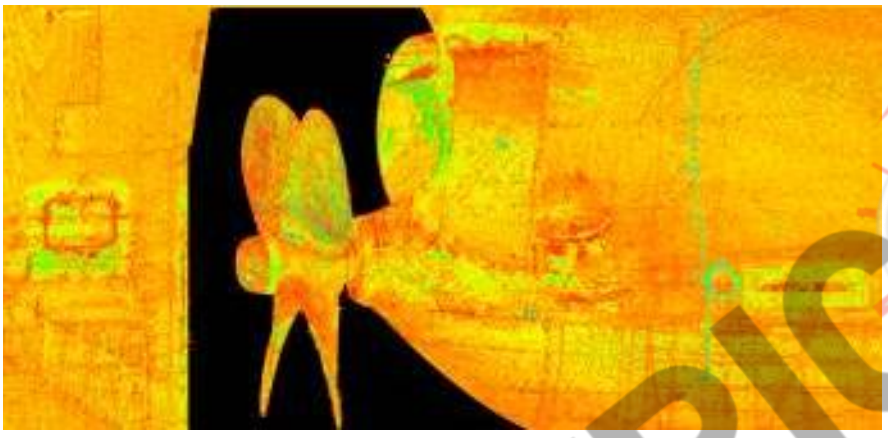
Scope of Work

➢ Scanning

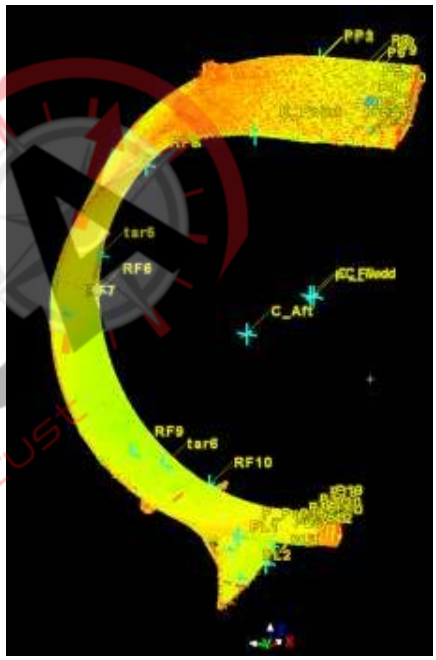
Firstly, we proceed with the scanning of the duct. It is better to be accomplished before the ship dry docking as it is a non critical procedure. Then, in the dry dock, the ship stern is, also, scanned. Several Laser Scanner setups are required in order to cover objects of interest.

➢ Processing

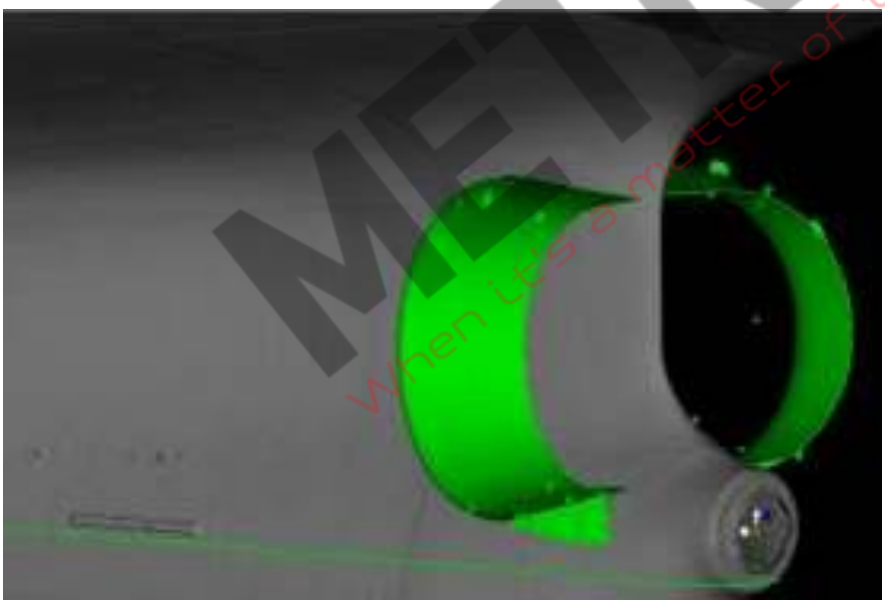
The second step requires data importing into and processing with specific software on which point clouds will be registered, meshed and form the model of the ship stern and duct. Then, the intersection of the two meshes provides the exact cutting – welding zones.



Scanned stern



Scanned duct



Modeled stern and duct when intersected

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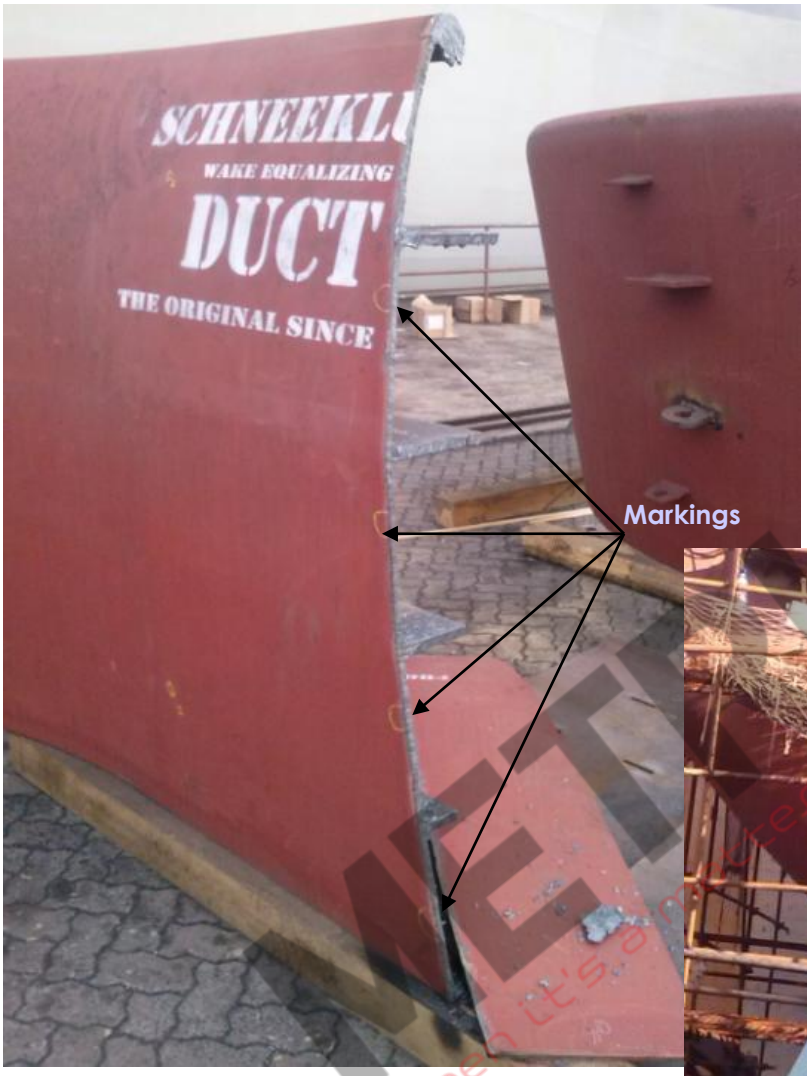
Marking

The final step is the marking of the area where the duct should be cut and where on the stern will be welded. A high precision Leica Total Station is used.



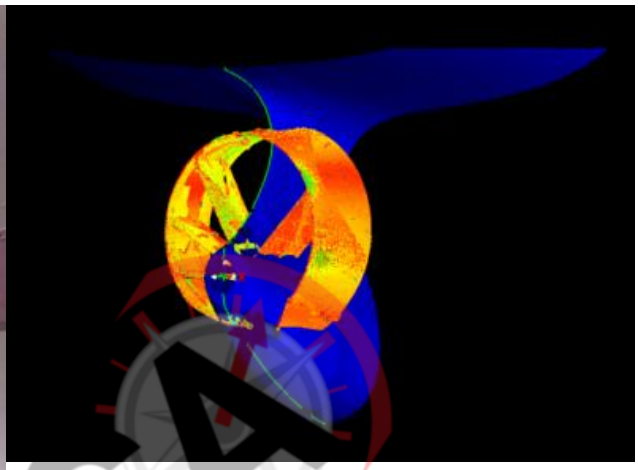
Marks on the duct

Total station Leica TDRA 6000
used for marking

➢ Accomplishment of the task

After the marking of intersection points, only one attempt is needed to fit the duct to the correct place. This installation lasts 20 manhours approximately, plus the time needed for the welding. The traditional method of trial and error compared to this one is time consuming and costly. In addition, the methodology that METRICA S.A uses, guarantees that the fitting of the duct is achieved with an accuracy of 3 mm or better.

Duct fitting in progress



Scanned stern and duct fitted before fitting

Leica Laser Scanner P20