

## **Renewal of data acquisition platforms and data processing**

### **Introduction**

The Norwegian Hydrographic Service (NHS) has continuous improvements of processes as a guiding principle, based on the LEAN philosophy. With respect to data collection we are aiming at more efficient survey operations, cleaner raw data and less man-machine interactions during the processing of survey data. Measures taken to achieve improvements include new survey launches, new multibeam systems (MBES) and improved software for data processing.

### **Survey launches and equipment**

Norway has a very long coastline (100 915 km) with a high number of islands (239 057), making surveying quite demanding. The depth range in the coastal area is 0-1300m. In general the coastal surveying is done by a expedition vessel equipped with two survey launches. Due to the complexity of the coast the greater part of the surveying is done from the launches. The expedition vessel most of the time stays moored or anchored. A major part of the data processing takes place on board the vessel.

To reduce the transit time from the expedition vessel to the survey area we needed faster launches. The new launches have a transit speed of 25 knots which is much faster than the former ones. The new MBES has an efficient operation range (good bottom coverage) of appr 300m (maximum range 600m). Compared to the former version with a typical operational range of 100m, the new equipment represents a considerable improvement. In addition the system has a higher density of pings and delivers much cleaner data.

A well suited data acquisition platform is a successful integration of the launch itself and the equipment. For this reason we hired a laboratory to model and test out the optimal position for the transducers. Avoiding air bubbles at the transducer head at surveying speed, and at the same time maintain the high transit speed, was challenging. The final solution has proven quite successful, except for very low survey speed (less than 2 knots – attempts to minimize the problem is in progress). In the range 3-10 knots the data quality is good. The ergonomic working conditions and low noise level was extensively addressed during the construction period. The noise level at full speed is below 57db.

NHS ordered three identical launches, two belonging to the expedition vessel and the third operated for supporting the Norwegian Coastal Administration with updated surveying after changes in harbors, fairways etc. All three launches were delivered in first half of 2014.



Fig. A new survey launch: Length 11.15m, breadth 3.4m, service speed 25knots, 2 waterjets, EM2040 Dual head MBES, Seapath 330+ motion sensor

### **Data processing software**

A vital part of the tools used for processing of survey data are based on quite old in-house developed software. The system requires a lot of manual interactions and judgments from the operators. A couple of years ago we decided introduce new tools that could make the data processing more efficient. After a tender process we ended up with a contract with Caris to improve and add functionality to the existing HIPS/SIPS and Base Editor. The project name is Pleco (a fish popular in aquariums for their ability of cleaning the tanks). Totally 317 requirements were included in the specifications, of which 116 improvements were mandatory.

The first part of the deliverance took place in February 2013 and is partly integrated into our production line. The complete version to be implemented by November 2014 and the final system approval is expected to be in February 2015