

– SAIPEM CASE STUDY –
WEST AFRICAN TRANSFORM MARGIN INSTALLATION WORK

Background

SAIPEM is a world leader in the Oil & Gas contracting services sector, providing turnkey engineering, procurement, project management and construction services with distinctive capabilities in the design and the execution of large-scale offshore and onshore projects.

The SAIPEM 3000, a self propelled DP crane vessel, was contracted for offshore installation work in the West African Transform Margin area. This area, which extends nearly 1,500 km along the coasts of Ghana, Ivory Coast and Liberia, is becoming one of the most exciting production region in Africa. Recent oil discoveries now increase the likelihood that more reserves could exist in this region which has been the subject of limited exploration so far.

Project challenges

The West Africa Transform Margin oil reserves are positioned in the trajectory of the Guinea Current, an eastern ocean boundary current flowing at approximately 3°N along the western coast of Africa. Emanating from the North Equatorial Countercurrent (NECC) and the Canary Current, the Guinea Current strength is affected by the seasonal instability of these two currents. It experiences a minimum during the winter (November through February) and a maximum during the summer (May through September). Its speed can also at times be higher in deep water than in coastal waters.

SAIPEM experience further demonstrated that currents close to the jet core were significantly undervalued by the monthly average statistics of the pilot charts: a pre-operation drift test completed by SAIPEM in 2009 had showed intensities eventually higher than the operability limits of the SAIPEM S3000. As a result SAIPEM asked SAT-OCEAN to provide a dataset covering the period of the drift test. The correlation between SAT-OCEAN currents and on-site data proved very good and confirmed that SAT-OCEAN approach, solely relying on a combination of satellite measurements and advanced modeling, was capable of accurately representing the regional ocean circulation.

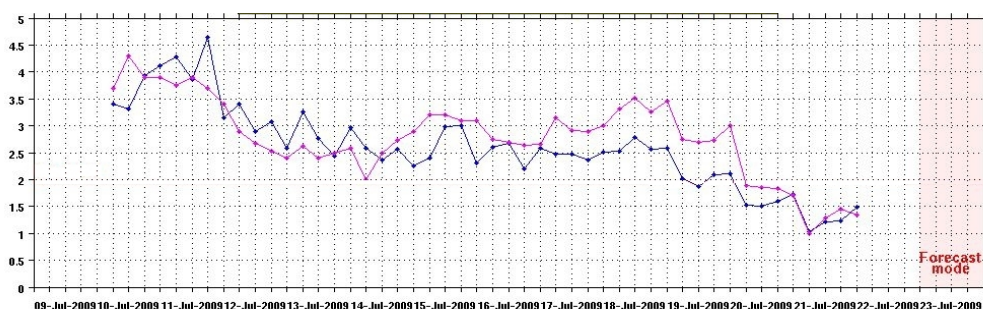


Figure 1: SAT-OCEAN magnitude (blue) vs. on-site measured magnitude (Mag) [knots]

Downtime analysis

In order to carefully schedule its operations in the West African Transform Margin region, SAIPEM requested a Metocean statistic study from SAT-OCEAN. The objective was to define the most appropriate time window for the installation project. SAT-OCEAN used its worldwide archived data of hindcast currents to extract the relevant local time series, and delivered to SAIPEM operability statistics centered on the months of interest.

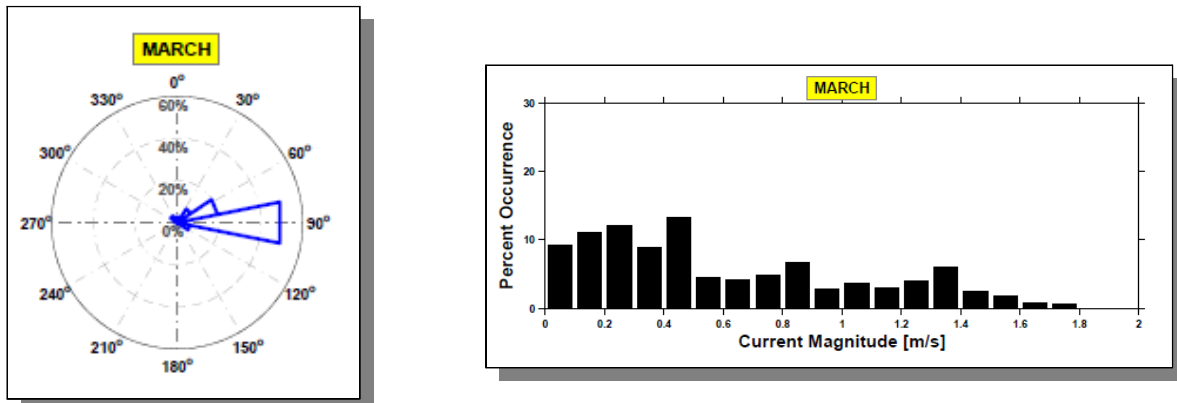


Figure 2: Current direction/magnitude distribution and occurrences

Once on site, SAIPEM needed to precisely monitor local current magnitude for the duration of two operations, the first one planned in February and the second one in March 2010. To that end, SAT-OCEAN provided a daily Metocean report including 5-day high resolution ($1/32^\circ$) current forecasts. This service was used by the SAIPEM 3000 to fine-tune operations schedule and guarantee a safe execution.

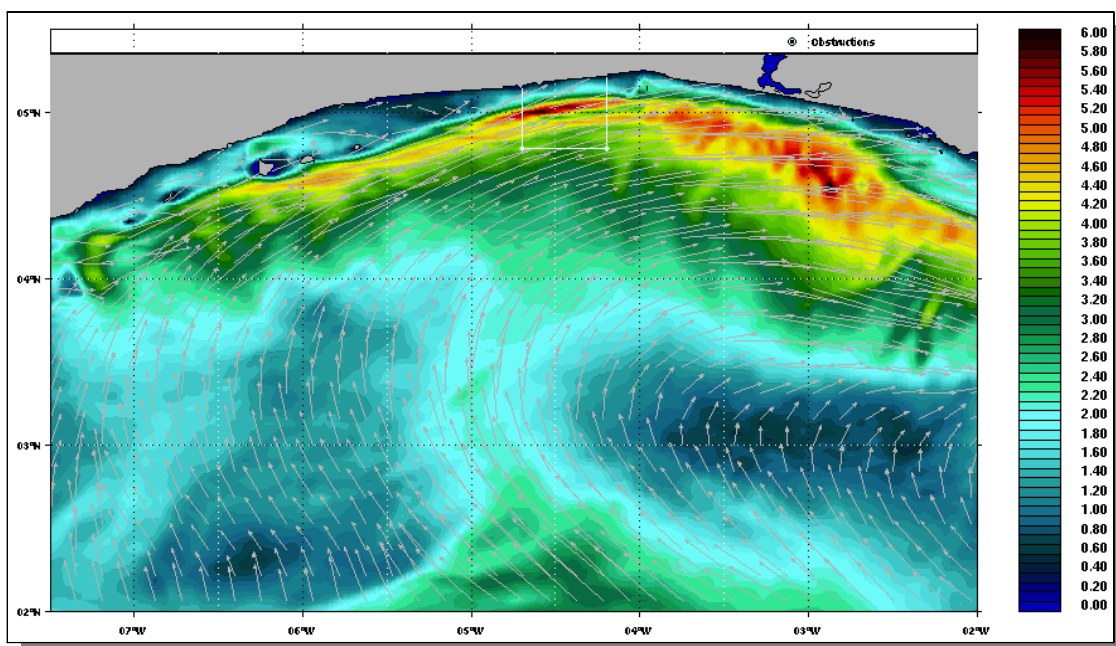


Figure 3: SAT-OCEAN surface currents (knots) predictions

Advanced routing services

For the mobilization of the SAIPEM 3000, SAT-OCEAN also delivered advanced routing services based on high resolution current forecasts. This innovative service consists in the daily computing of the most cost-effective route based on vessel characteristics and updated waves, winds and currents forecast. The ship receives every day a report including waypoints from last known position as well as complete route statistics (downwind, extreme conditions, ETA).

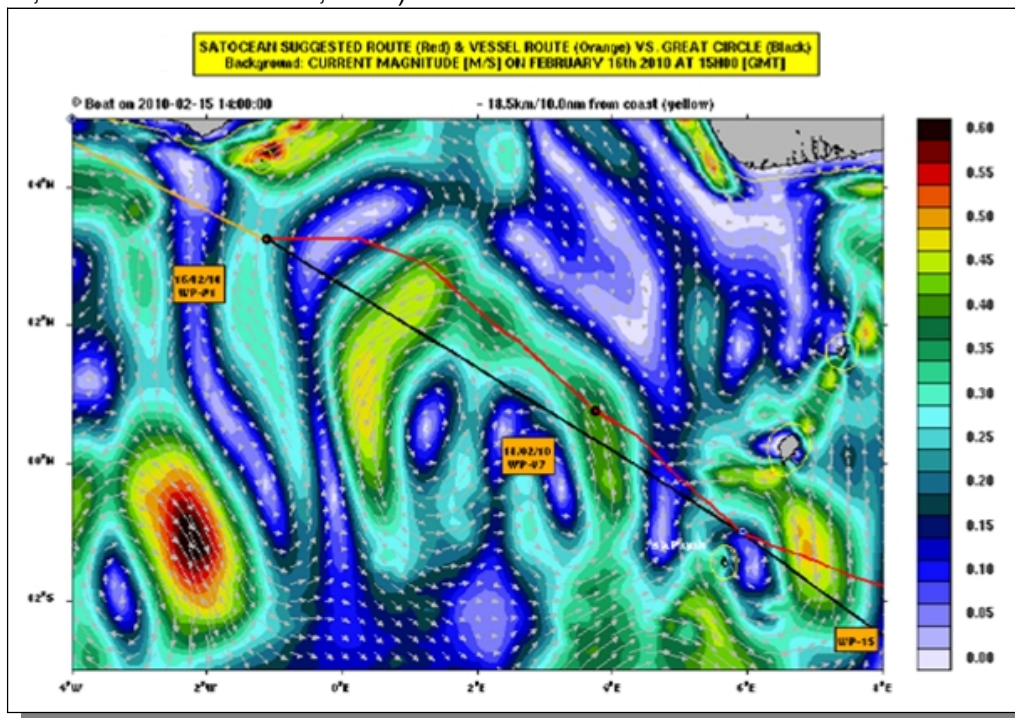


Figure 4: SAT-OCEAN suggested route in Gulf of Guinea

“The data provided by SAT-OCEAN proved very helpful, allowing us to steer clear of some unfavorable strong current pockets and take advantage of inline currents and winds” says Martin Amos, Master SAIPEM 3000.

The post voyage analysis comparing SAT-OCEAN suggested route to the Great Circle route showed a time saving of 17 hours for the voyage from Pointe Noire to Abidjan. Similar benefits were observed on the way back.

“For an installation in such a challenging offshore area, we clearly needed a trusted Metocean provider to support the operation planning and monitoring. SAT-OCEAN models proved quite accurate in the region. Furthermore, their capacity to also provide “current aware” routing for the different voyages of the S3000 in the Gulf of Guinea made them the perfect partner.” says Guillaume Winckler, Project Manager – SAIPEM SA