

Structural Integrity Monitoring



The JF40 MEMS-based Inertial Measurement Unit (IMU)



Unix based processing unit BlackBox

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The increase in demand to evaluate the performance and health of platform have searched the need for Structural Integrity Monitoring. HGIS solutions reduces the need for Schedule Base Inspection which contributes to tremendous amount of cost savings. It also assists with recertification or way-forward analysis of the structure/platform.

HGIS caters comprehensive solutions pertaining to the assessment and monitoring of the structure/platform covering:

- Structural Deformation Survey
- Continuous Subsidence Monitoring Survey (CSMS)
- Structural Dynamic Monitoring And Integrity Assessment
- Platform Air Gap Surveys
- Platform Verification Surveys

The combination of the above services will enable clients to assess the full structural integrity of the asset which contributes to clarity in decision making, greater cost efficiency and higher safety aspects of the lifespan of the structure/platform.

FEATURES

- ✓ Long Term Assessment of Structural Integrity
- ✓ Extend Structure's Operating Life
- ✓ Optimise Inspection Schedules
- ✓ Prevent Damage During Rig Moves and Jacking Operations
- ✓ Online Data Portal via Siri-Live
- ✓ Optional Post Processing and Reporting of Data



PLATFORM DEFORMATION SURVEY

Offshore platforms are exposed to deformation due to the instability of the platform and other factors caused by plate motion or post-seismic motions of an earthquake. The use of Space Geodetic Techniques, particularly Global Navigation Satellites System (GNSS,) to monitor the deformation of a structure has been increasing in demand over the years.

Platform Deformation Survey is necessary to detect and estimate the motion rate and the displacement magnitude between two GNSS observation epochs. Combined with terrestrial levelling technique, a complete deformation analysis can be performed in terms of point displacement, platform tilting as well as the orientation.

FEATURES



DGNSS System

Single or Dual Frequency DGNSS systems (0.5m-5m at 2 sigma level).



Range Error Assessment

WADGNSS technique assessing satellite orbit error, satellite clock error and ionosphere delay.



Centimeter Accuracy

Real Time Kinematic (RTK) observation or corrections post processed with double-differencing method.



Data QC & Processing

Data QC and Processing using Bernese Software and Trimble Business Centre.



On-Line Ocean Loading

On-Line Ocean Loading computation from Onsala Space Observatory (OSO), Sweden.



Bias-Free Solutions

Bias-Free solution (carrier phase ambiguity solutions).



Bias Fixed Solutions

Bias-Fixed Solution (using Quasi Ionosphere-Free (QIF) and SEARCH strategy.

CONTINUE SUBSIDENCE MONITORING SURVEY (CSMS)

Continuous Subsidence Monitoring Survey (CSMS) is the operations of determining the subsidence over a longer time frame. This technique uses GNSS data, processes the data by utilising specialised processing software and then analyses the geometrical stability and vertical motion on the offshore platforms.

FEATURES



Double Differencing Technique

Network processing and combination using Double-Differencing techniques.



Precise Point Positioning

Absolute Technique using Precise Point Positioning (PPP) Technique with Bernese Software.



Preparation & Management of Data

Data preparation and management (RINEX, TEQC by UNAVCO, RINHBEX and Centre of Orbit Determination for Europe-CODE).

STRUCTURAL DYNAMIC MONITORING AND INTEGRITY ASSESSMENT

Exclusive agent of



Siri Marine B.V. specialises in Condition & Motion Monitoring and owns in-house manufactured integrated Motion Sensors which is a state-of-the-art monitoring system.

Offshore structures and even onshore structures are exposed to natural forces such as weight/load, wind forces, waves, jack-up-up leg subsidence and even earthquakes in specific seismic areas. All these causes the natural frequency of motions/impacts to the structure which in the long run may lead to changes in the condition and structural integrity of an object.

Therefore, by having to perform a Structural Dynamic Monitoring and Integrity Assessment, the health and fatigue of structures/platform can be monitored 24/7 to assess the integrity with its behaviour on the natural frequency vs the designed frequency. It can also be used as a decision support tool during rig moves and jacking operations to prevent immediate damage.

For more info please request for Siri Marine's product specification sheet.

Platform Inclination and Surge Motions

Graph showing motion periods changed significantly after that moment and motion amplitudes reduced. The influence of seasonal (monsoon) environmental impact also reduces significantly.

