BRIEF SUMMARY

[0006] A system that can identify, with a high degree of certainty, which position references and algorithms are not operating within acceptable limits can reduce the overall reaction time of the operator towards correcting the drive-off (DO). This reaction time has an inverse relationship with water depth due to the geometric relationship of the vessel, riser, and wellhead. As a result, DO mitigation and detection measures become increasingly more necessary in shallow water. An apparatus and method are described below that can be used to aid in rapidly determining if a vessel is experiencing a DO event and further identify the subsystem(s) that are at fault.

[0007] In one aspect, a method for determining if a vessel is experiencing a drive-off event is disclosed. The method includes the steps of: determining vessel motion with a dynamic positioning control system model for the vessel; measuring vessel motion with a sensor controlled independently from the vessel dynamic positioning control system; processing, with a processor of the dynamic positioning control system, the modeled vessel motion and the measured vessel motion to determine whether there is a discrepancy between the modeled vessel motion and the measured vessel motion; and controlling, by the processor of the dynamic positioning control system, the vessel motion based, at least in part, on the processing of the modeled vessel motion and the measured vessel motion. The method may further include identifying a parameter of the dynamic positioning control system model causing the discrepancy and adjusting the vessel motion based, at least in part, on the identification of the modeling parameter causing the discrepancy. The method may also further includes isolating the modeling parameter causing the discrepancy from the dynamic positioning control system model, updating the modeling parameter, and reintroducing the modeling parameter into the model after the modeling parameter has been updated.

[0008] The step of determining, measuring, processing, and controlling may be repeated, such as to obtain real-time identification and correction of a DO. The measuring of vessel motion may include measuring at least one of a velocity and a rotation of the vessel. The processing may include comparing the modeled vessel motion with the measured vessel motion. The dynamic

positioning control system may model at least one of vessel surge, sway, heave, roll, pitch, and yaw to determine vessel motion. The controlling may include controlling at least one of the vessel surge, sway, and yaw. The controlling may further include sending commands to vessel thruster drives.

[0008a] In another aspect, there is disclosed an apparatus, comprising: a processor configured to perform the steps comprising: determining vessel motion with a dynamic positioning control system model for the vessel; measuring vessel motion with a sensor controlled independently from the vessel dynamic positioning control system; processing the modeled vessel motion and the measured vessel motion to determine whether there is a discrepancy between the modeled vessel motion and the measured vessel motion; and controlling the vessel motion based, at least in part, on the processing of the modeled vessel motion and the measured vessel motion.

[0009] The foregoing has outlined rather broadly certain features and technical advantages of embodiments of the present invention in order that the detailed description that follows may be better understood. Additional features and advantages will be described hereinafter that form the subject of the claims of the invention. It should be appreciated by those having ordinary skill in the art that the conception and specific embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same or similar purposes. It should also be realized by those having ordinary skill in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims. Additional features will be better understood from the following description when considered in connection with the accompanying figures. It is to be expressly understood, however, that each of the figures is provided for the purpose of illustration and description only and is not intended to limit the present invention.