indication of the leg bending moment than the rack phase differential measurement. Advantageously, multiple load measuring units can be provided along the leg guide.

The invention further relates to a leg guide provided with such a load measuring unit and to a jack-up platform provided with such a load measuring system.

The invention also relates to a method for monitoring a bending moment in a leg of a jack-up platform, as well as to a control system.

In view of the above, according to a first aspect of the present disclosure, there is provided a measurement system comprising at least one parameter measurement unit that is arranged for measuring a value of a parameter on a leg guide of a jack-up platform.

According to a second aspect of the present disclosure, there is provided a leg guide for mounting on a hull of a jack-up platform, arranged for guiding a leg during movement of the leg with respect to the hull. The leg guide is provided with at least one parameter, such as load, measuring unit according to any of the measurement system described herein for measuring the said parameter of the leg guide, e.g. by the leg exerted onto the leg guide.

According to a third aspect of the present disclosure, there is provided a jack-up platform comprising a hull and at least one leg adjustable with respect to the hull. The leg is adjustable through a leg opening in the hull in which leg opening at least one leg guide is provided to guide the leg during adjustment. The leg guide is provided with at least one load measuring unit according to any of the measurement system described herein for measuring the load the leg exerts onto the leg guide.

According to a fourth aspect of the present disclosure, there is provided a method for monitoring a bending moment in a leg of a jack-up platform. The method comprises: providing a load measuring unit to a leg guide

of the jack-up platform; measuring the load of the leg onto the load measuring unit; and determining a bending moment in the leg based on the measured load.

According to a fifth aspect of the present disclosure, there is provided a control system for a guide load measurement system according to any of the measurement system described herein. The control system is configured to receive loads measured by the guide load measurement unit of a leg, further is configured to determine a leg bending moment based on the measured loads, further is configured to output the determined leg bending moment of the respective leg to a user interface.

Further advantageous embodiments are represented in the subclaims.

Description of the invention

The invention will further be elucidated on the basis of exemplary embodiments given by way of non-limitative description and illustration.

In the illustration shows:

Figure 1a schematically the forces during a preload operation on a sloping sea bed;

Figure 1b schematically the forces during a leg pulling operation;

Figure 2a a schematic top view of a leg in a leg opening of a hull of a jack-up platform;

Figure 2b a schematic view of the plane A-A to the chord of the leg as indicated in figure 2a;

Figure 3 a schematic representation of the leg loads on the leg guide;

Figure 4a a leg guide according to the prior art;

Figure 4b a leg guide provided with a load measuring unit;

Figure 4c an array of load sensing means of a load measuring unit;

Figure 5 a general arrangement of a jack-up platform provided with a load measuring system and a control unit therefor.