GOING ON LOCATION FEASIBILITY TAKING INTO ACCOUNT OFFSHORE LOCATION OCEAN CONDITIONS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation of U.S. Application No. 15/218,935, entitled "Going On Location Feasibility," and filed July 25, 2016, which claims priority to U.S. Provisional Patent Application No. 62/209,407, entitled "Using Onboard Sensor Data To Assess Feasibility Of Jackups To Go On Location", filed August 25, 2015, the entirety of which is incorporated by reference herein for all purposes.

BACKGROUND

[0002] This section is intended to introduce the reader to various aspects of art that may be related to various aspects of the present disclosure, which are described and/or claimed below. This discussion is believed to be helpful in providing the reader with background information to facilitate a better understanding of the various aspects of the present disclosure. Accordingly, it should be understood that these statements are to be read in this light, and not as admissions of prior art.

[0003] This invention relates to mobile offshore units, specifically self-elevating units. Self-elevating units are used in the offshore industry for a multitude of tasks including but not limited to drilling and production operations, general construction operations, crew accommodation, wind-turbine installation, etc. Self-elevating units can refer to jackups, liftboats, jackup barges, mobile offshore drilling units (MODUs), mobile offshore production units (MOPUs), or the like.

Self-elevating units (henceforth referred to as "units") are typically constructed of a hull, supported on one or more legs which extend through or on the side of the hull. A lifting system or "jacking system" is installed on the unit for the purpose of raising or lowering the legs relative to the hull. The self-elevating unit is designed such that the hull is buoyant and can float,

supporting itself and the legs and its cargo (e.g., in an "afloat" mode). Once the self-elevating unit reaches the desired location where it is to operate, the legs are lowered to the seabed and the hull is raised above the waterline (e.g., in an "elevated" mode), so that there is no longer a buoyancy force on the hull, creating a stable platform with a positive airgap. One of the first steps in the process of transitioning from afloat to elevated mode is commonly referred to as "going on location."

[0005] Conversely, the process of transitioning from elevated mode to afloat mode is commonly referred to as "coming off location." The self-elevating unit lowers its hull from positive air gap into the water, partially submerging the hull. The jacking system lowers the hull until the buoyancy of the hull is sufficient to extract and raise the legs. The legs of the self-elevating unit typically incorporate a footing that provides the bearing or contact surface between the seabed (and/or the soil beneath the seabed) and the unit. The legs of a self-elevating unit may have an individual footing for each leg (spudcan) or the legs may share a common footing (mat).

[0006] Analysis of units in the elevated and afloat modes is fairly well understood, and standards exist for use in the development of proper operating conditions for both modes of operation. The transition phase for self-elevating units (e.g., going on location or coming off location), however, is not as well understood.

SUMMARY

[0006a] According to a first aspect, there is provided a device, including: an interface configured to receive a first signal indicative of a sensed condition affecting an offshore unit when the offshore unit is disposed in an afloat mode in which legs of the offshore unit are disposed above a seabed and receive a second signal indicative of a second sensed condition affecting the offshore unit when the offshore unit is disposed in an elevated mode in which the legs of the offshore unit are coupled to the seabed; a memory configured to store a first set of values

corresponding to limits for conditions affecting the offshore unit when the offshore unit is in the afloat mode and a second set of values corresponding to limits for conditions affecting the offshore unit when the offshore unit is in the afloat mode; and a processor configured to: determine if the sensed condition of the offshore unit indicated by the first signal exceeds at least one value of the first set of values when the first signal is received; determine if the second sensed condition of the offshore unit indicated by the second signal exceeds at least one value of the second set of values when the second signal is received; generate an indication to begin a going on location operation by the offshore unit inclusive of transitioning the offshore unit from the afloat mode to the elevated mode of the offshore unit when the processor determines that the sensed condition is less than or equal to the at least one value of the first set of values; and generate a second indication to begin a coming off location operation by the offshore unit inclusive of transitioning the offshore unit from the elevated mode to the afloat mode of the offshore unit when the processor determines that the second sensed condition is less than or equal to the at least one value of the second set of values.

[0006b] According to a second aspect, there is provided a system, including: a sensor configured to measure a metocean condition about an offshore unit when the offshore unit is disposed in an elevated mode in which legs of the offshore unit are coupled to a seabed and generate a signal indicative of the metocean condition; and a control monitor configured to be coupled to the sensor, wherein the control monitor includes: an interface configured to receive the signal indicative of the metocean condition; a memory configured to store a set of values corresponding to predetermined limits for metocean conditions when the offshore unit is in the elevated mode; and a processor configured to: determine if the metocean condition indicated by the signal exceeds at least one value of the set of values; and generate an indication to begin a coming off location operation by the offshore unit inclusive of transitioning the offshore unit from the elevated mode to an afloat mode of the offshore unit in which the legs of the offshore unit are

disposed above the seabed when the processor determines that the metocean condition is less than or equal to the at least one value.

[0006c] According to a third aspect, there is provided a tangible non-transitory computer-readable medium having computer executable code stored thereon, the code including instructions to cause a processor to: receive a signal indicative of a metocean condition about an offshore unit when the offshore unit is disposed in an elevated mode in which legs of the offshore unit are coupled to a seabed; receive a predetermined value corresponding to a limit of a metocean condition about the offshore unit when the offshore unit is in the elevated mode; determine if the metocean condition about the offshore unit indicated by the signal exceeds the predetermined value; and generate an indication to begin a coming off location operation by the offshore unit inclusive of transitioning the offshore unit from the elevated mode to an afloat mode of the offshore unit in which the legs of the offshore unit are disposed above the seabed when the processor determines that the metocean condition about the offshore unit is less than or equal to the at least one value.

BRIEF DESCRIPTION OF DRAWINGS

[0007] FIG. 1 illustrates a profile view of a self-elevating unit in the afloat mode;

[0008] FIG. 2 illustrate a profile view of a self-elevating unit in the elevated mode;

[0009] FIG. 3 illustrates a profile view of a self-elevating unit during the transition segment from afloat to elevated mode;

[0010] FIG. 4 illustrates a profile view of a self-elevating unit making impact with the seabed during the transition segment from afloat to elevated mode;

[0011] FIG. 5 illustrates a schematic of a control system of a self-elevating unit;