Claims

1. A method for conducting a subterranean operation, the method comprising:

storing, via a rig controller, pre-determined characteristics of a piece of equipment, for supporting the subterranean operation performed on a rig, in a unique data record associated with the piece of equipment;

receiving at the rig controller the pre-determined characteristics of an expected piece of equipment to be used in the subterranean operation;

imaging, via one or more imaging sensors on a pipe handler, the piece of equipment in a horizontal storage area, wherein the pipe handler is horizontally moveable above the horizontal storage area in a first direction and a second direction, and wherein the first direction is opposite the second direction;

determining, via the rig controller and based on the imagery, actual characteristics of the piece of equipment in response to the imaging via the one or more imaging sensors;

comparing, via the rig controller, the actual characteristics to the pre-determined characteristics; and

verifying whether or not the piece of equipment is an expected piece of equipment based on the comparing.

2. The method of claim 1, wherein the piece of equipment is one of a tubular, a tubular stand, a tool, or a bottom hole assembly (BHA).

3. The method of claim 1, wherein the unique data record comprises one of:

contact zones of the piece of equipment,

non-contact zones of the piece of equipment,

center of gravity of the piece of equipment,

diameters along the piece of equipment,

shapes of the piece of equipment,

weight of the piece of equipment,

dimensions of the piece of equipment,

type of the piece of equipment,

usage data of the piece of equipment,

degradation parameters of the piece of equipment,

manufacturing details of the piece of equipment,

longitudinal linearity of the piece of equipment,

historical data of the piece of equipment,

storage location of the piece of equipment,

orientation of the piece of equipment, or

combinations thereof.

4. The method of claim 3, wherein the degradation parameters of the piece of equipment comprise a location of wear, an indicator of wear, a type of wear, a location of damage, an indicator of damage, a type of damage, hours in service, or combinations thereof.

5. A method for conducting a subterranean operation, the method comprising:

storing, via a rig controller, pre-determined characteristics of a piece of equipment, which supports the subterranean operation performed on a rig, in a unique data record associated with the piece of equipment;

receiving at the rig controller the pre-determined characteristics of an expected piece of equipment to be used in the subterranean operation;

imaging, via one or more imaging sensors on a pipe handler, the piece of equipment in a horizontal storage area;

determining, via the rig controller and based on the imagery, actual characteristics of the piece of equipment in response to the imaging via the one or more imaging sensors;

comparing, via the rig controller, the actual characteristics to the pre-determined characteristics;

verifying whether or not the piece of equipment is the expected piece of equipment based on the comparing;

calculating an estimated center of gravity of the piece of equipment, comparing the estimated center of gravity to a center of gravity in the unique data record; and

initiating corrective action on the rig when the estimated center of gravity is not substantially equal to the center of gravity in the unique data record.

6. The method of claim 3, further comprising calculating an estimated center of gravity of the piece of equipment, the calculating comprising:

determining, via the rig controller, the dimensions of the piece of equipment including a length or a diameter;

determining a volume of material in the piece of equipment based on the dimensions;

determining a mass of the piece of equipment based on the volume of material and properties of the material; and

calculating the estimated center of gravity of the piece of equipment based on the mass of the piece of equipment and the dimensions.

7. The method of claim 3, further comprising calculating an estimated center of gravity of the piece of equipment, the calculating comprising:

determining, via the rig controller, the dimensions of the piece of equipment including lengths and diameters;

manipulating the piece of equipment via rig equipment;

sensing torque and strain of the rig equipment, via sensors on the rig equipment, as the rig equipment manipulates the piece of equipment; and

calculating an estimated center of gravity of the piece of equipment based on the torque and strain of the rig equipment and the dimensions.

8. The method of claim 3, wherein the usage data comprises time the piece of equipment is on or near the rig, where the piece of equipment is used in the subterranean operation, when the piece of equipment is used in the subterranean operation, how the piece of equipment is used in the subterranean operation, or combinations thereof.

9. The method of claim 3, wherein the historical data comprises one of the usage data, storage location data, life cycle data, expected end of life data, degradation data, unique identifiers, visible features detected, linearity data, calculated characteristics, torque measurements, revolutions required to thread or unthread a joint, or combinations thereof.

10. The method of claim 3, wherein the longitudinal linearity of the piece of equipment comprises measurements of deviation of the piece of equipment from being parallel to a desired central longitudinal axis.

11. The method of claim 1, wherein the one or more imaging sensors comprise 2D camera, 3D camera, infrared camera, CCTV camera, X-ray sensor, strain gauge, torque sensor, accelerometer, optical sensor, laser sensor, physical contact sensor, contact sensor with encoder, audio sensor, pressure sensor, temperature sensor, environmental sensor, gas sensor, liquid sensor, or combinations thereof.

12. The method of claim 1, further comprising receiving the pre-determined characteristics of the piece of equipment from a manufacturer, an operator, a remote controller, lab tests, data books, or combinations thereof.

13. A system for conducting a subterranean operation, the system comprising:

a rig configured to perform the subterranean operation;

a pipe handler that manipulates a piece of equipment on the rig during the subterranean operation, wherein the pipe handler is horizontally moveable over a horizontal storage area in a first direction and a second direction, and wherein the first direction is opposite the second direction; and

one or more imaging sensors on the pipe handler configured to collect images of the piece of equipment in the horizontal storage area;

a rig controller configured to:

store pre-determined characteristics of the piece of equipment in a database in a unique data record associated with the piece of equipment;

receive, from the database, the pre-determined characteristics of an expected piece of equipment to be utilized in the subterranean operation;

receive the images from the one or more imaging sensors;

determine actual characteristics of the piece of equipment based on the images;

compare the actual characteristics to the pre-determined characteristics; and

verify whether or not the piece of equipment is the expected piece of equipment based on the comparison.

14. The system of claim 13, wherein the unique data record comprises one of:

contact zones of the piece of equipment,

non-contact zones of the piece of equipment,

center of gravity of the piece of equipment,

diameters along the piece of equipment,

shapes of the piece of equipment,

weight of the piece of equipment,

dimensions of the piece of equipment,

type of the piece of equipment,

usage data of the piece of equipment,

degradation parameters of the piece of equipment,

manufacturing details of the piece of equipment,

longitudinal linearity of the piece of equipment,

historical data of the piece of equipment,

storage location,

orientation, or

combinations thereof.

15. The system of claim 14, wherein the type of the piece of equipment is selected from a group consisting of a tool, a tubular, a tubular stand, and a BHA,

wherein the degradation parameters of the piece of equipment degradation parameters comprise a location of wear, a severity indicator of wear, a type of wear, a location of damage, a severity indicator of damage, a type of damage, hours in service, or combinations thereof,

wherein the non-contact zones are specific zones or areas on the piece of equipment that should not be contacted by rig equipment when the piece of equipment is manipulated by the rig equipment,

wherein the contact zones are specific zones or areas on the piece of equipment that can be contacted by rig equipment when the piece of equipment is manipulated by the rig equipment,

wherein the usage data comprises time the piece of equipment is in operation on the rig, where the piece of equipment is used in the subterranean operation, when the piece of equipment is used in the subterranean operation, how the piece of equipment is used in the subterranean operation, or combinations thereof, or

wherein the historical data comprises the usage data, storage location data, life cycle data, expected end of life data, degradation data, unique identifiers, visible features detected, linearity data, calculated characteristics, torque measurements, torque requirements, revolutions required to thread or unthread a joint, or combinations thereof.