SUMMARY

[0004] According to an aspect of the present specification, a system for non-invasive determination of target properties of a pressure vessel is provided. The system includes: a signal generator acoustically coupled to a fluid contained in the pressure vessel and disposed externally to the pressure vessel, the signal generator to emit acoustic signals into the pressure vessel; a plurality of sensors acoustically coupled to the fluid and disposed externally to the pressure vessel to detect the acoustic signals; a thermodilatohydrometer configured to determine dissolved gas parameters of the fluid contained within the pressure vessel; a control device interconnected with the signal generator and the plurality of sensors, the control device configured to: control the signal generator to emit acoustic signals into the fluid; obtain sensor data from the plurality of sensors, the sensor data representing the acoustic signals as received by the plurality of sensors; obtain the dissolved gas parameters from the thermodilatohydrometer; compute, based on the detected signal data and the dissolved gas parameters, the target properties of the pressure vessel, the target properties comprising one or more of: a thickness of a wall of the pressure vessel, and a location of a fault in the pressure vessel; and output an indication of the target properties.

[0005] According to another aspect of the present specification, a non-invasive method for determining target properties of a pressure vessel is provided. The method includes:

controlling a signal generator to emit acoustic signals into a fluid contained in the pressure vessel from externally to the pressure vessel; obtaining sensor data representing the acoustic signals as transmitted through the fluid, the sensor data obtained externally to the pressure vessel; obtaining dissolved gas parameters of the fluid contained within the pressure vessel; computing, based on the sensor data and the dissolved gas parameters, the target properties of the pressure vessel, the target properties comprising one or more of: a thickness of a wall of the pressure vessel, and a location of a fault in the pressure vessel; and outputting an indication of the target properties.

BRIEF DESCRIPTION OF DRAWINGS