MODULAR MOBILE FLOW METER SYSTEM

BACKGROUND

Field

[0001] The present disclosure relates to techniques for measuring multiphase flows from wellbores. More particularly, the present disclosure relates to tools and methods for a mobile multiphase flowmeter system.

Description of the Related Art

[0002] In many hydrocarbon well applications, various test procedures are employed to evaluate characteristics of the produced well fluid or other reservoir characteristics. Often, the produced well fluid contains a mixture of phases, such as a mixture of oil, water, gas, and solids or other components. Test procedures have been employed to evaluate the phases of produced fluids from specific wells. For example, various types of well testing equipment utilize multiphase flow meters to measure the various phases of the produced fluid. Multiphase flow meters, however, have different flow-range ratings and are selected according to the production flow rate of the well being tested. Thus, different multiphase flow meters with different flow-range ratings are selected according to the production flow rate of a given well. Switching the multiphase flow meter to accommodate the flow range of a different well can be an expensive and time-consuming procedure.

SUMMARY

[0003] In general, a methodology and system provide a modular and mobile system for testing flows of fluid which may comprise mixtures of constituents. A modular flow meter system comprises a plurality of modules which each have a multiphase flow meter coupled into a flow circuit. The flow circuits of the plurality of modules are selectively connectable to each other via flow connectors. Additionally, portions of the flow circuits may be selectively opened and closed to enable controlled routing of the fluid being tested through the desired multiphase flow meter or meters.

[0004] However, many modifications are possible without materially departing from the teachings of this disclosure. Accordingly, such modifications are intended to be included within the scope of this disclosure as defined in the claims.

[0004A] According to a first aspect, a system for mobile testing of flows of fluid may comprise: a modular flow meter system for testing flows of fluid, the modular flow meter system having a plurality of modules releasably coupled to each other, each module comprising: a skid; a flow circuit mounted on the skid; and a multiphase flow meter coupled into the flow circuit, the flow circuit having: an inlet through which the flow of fluid enters the flow circuit; an outlet through which the flow of fluid exits the flow circuit; a plurality of isolating valves operable to selectively allow or prevent flow through the multiphase flow meter; and a plurality of flow connector ends by which the flow circuit may be coupled with at least one adjacent flow circuit of an adjacent module.

[0004B] According to a second aspect, a system may comprise: a modular flow meter system transportable between well sites, the modular flow meter system comprising a plurality of modules which each have a multiphase flow meter and a flow circuit, the flow circuit of corresponding modules of the plurality of modules being selectively connectable via flow connectors, the flow circuits further comprising valves which may be actuated to allow or prevent fluid flow through selected multiphase flow meters.

[0004C] According to a third aspect, a method may comprise: preparing a plurality of modules such that each module has a flow meter and a flow circuit coupled to the flow meter; combining a desired number of modules to create a mobile, modular flowmeter system; joining the flow circuits of the desired number of modules; and adjusting at least one of the flow circuits to change a flow route and to direct a flow of fluid through at least one of the flow meters for analysis.