CLAIMS

1. Subsea pumping system for use in a remote location such as a subsea hydrocarbon production facility, comprising:
a source for high pressure fluid;
a reciprocating or oscillating fluid driven pump (12, 32, 66, 92); and
a sequential valve (17, 27, 102, 104, 106, 108, 110) able to transform a steady fluid pressure to a pulsating fluid pressure in a motive fluid for excitation of the fluid driven pump, the sequential valve being fitted in a branch pipeline (26, 70, 87) between the source for high pressure fluid and the fluid driven pump (12, 32, 66, 92),
wherein the high pressure fluid, used as a motive fluid for the pump (12, 32, 66, 92), is a fluid produced from a well in a pipeline (25, 62, 82).

2. The subsea pumping system according to claim 1, wherein the source for the motive fluid is a compressor using produced gas.

3. The subsea pumping system according to claim 1, wherein the source for the motive fluid is a liquid pump using produced liquids, i.e. oil or water.

4. The subsea pumping system according to claim 1, wherein the source for the motive fluid is an injection fluid provided by a pump located at topside facility.

5. The subsea pumping system according to claim 1, wherein the reciprocating pump is a diaphragm pump.

6. The subsea pumping system according to claim 1, wherein the reciprocating pump is a hose diaphragm pump.

7. The subsea pumping system according to claim 1, wherein the reciprocating pump is a piston pump.

8. The subsea pumping system according to claim 1, wherein the sequential valve comprises an inlet valve and an outlet valve that is synchronized to provide the pulses.

9. The subsea pumping system according to claim 1, wherein the sequential valve comprises a rotating sequencing valve.

10. The subsea pumping system according to claim 9, wherein the rotating sequencing valve has a rotational axis parallel or transverse to a pipeline axis for the pipeline wherein the valve is arranged.

11. The subsea pumping system according to claim 1, further comprising at least one separator.

CLAIMS

1. Subsea pumping system for use in a remote location such as a subsea hydrocarbon production facility, comprising
a source for high pressure fluid;
a reciprocating or oscillating fluid driven pump, and
a sequential valve able to transform a steady fluid pressure to a pulsating fluid pressure in a motive fluid for excitation of the fluid driven pump, the sequential valve is fitted in a branch pipeline between the source for high pressure fluid and the fluid driven pump,
wherein the high pressure fluid in a pipeline, used as a motive fluid for the fluid driven pump, is the hydrocarbon production produced from a well, and wherein the source for the motive fluid is a compressor using produced gas.

2. The subsea pumping system according to claim 1, wherein the reciprocating pump is a diaphragm pump.

3. The subsea pumping system according to claim 1, wherein the reciprocating pump is a hose diaphragm pump.

4. The subsea pumping system according to claim 1, wherein the reciprocating pump is a piston pump.

5. The subsea pumping system according to claim 1, wherein the sequential valve comprises an inlet valve and an outlet valve that is synchronized to provide the pulses.

6. The subsea pumping system according to claim 1, wherein the sequential valve comprises a rotating sequencing valve.

7. The subsea pumping system according to claim 6, wherein the rotating sequencing valve has a rotational axis parallel or transverse to a pipeline axis for the pipeline wherein the valve is arranged.

8. The subsea pumping system according to claim 1, further comprising at least one separator.