We claim:

1. A method of generating high pressure dual phase mixture, the method comprising:

mounting a dual phase mixture generator on a transportable platform, wherein the dual phase mixture generator comprises a mixing chamber connected with at least a first inlet, a second inlet, and a first outlet;

mounting a first container and a first pump on the transportable platform, wherein the first pump is operably connected with the first container;

deploying the transportable platform at a wellsite;

introducing a base fluid into the first inlet under high pressure;

introducing a gas into the second inlet under high pressure;

combining the base fluid with the gas in the mixing chamber to generate a high pressure dual phase mixture;

discharging the generated high pressure dual phase mixture via the outlet.

2. The method of claim 1, further comprising introducing the high pressure dual phase mixture into a well at the wellsite.

3. The method of claim 1, wherein the dual phase mixture is a foamed cement slurry.

4. The method of claim 3, wherein the base fluid is a cement slurry containing a foaming additive and the gas is nitrogen.

5. The method of claim 4, wherein the cement slurry containing a foaming additive is produced by cement generating equipment, the equipment either mounted transportable platform, not mounted on the transportable platform, or partially mounted on the transportable platform.

6. The method of claim 5, wherein the first container contains the foaming additive and the first pump pumps the foaming additive to the cement generating equipment for mixing with the cement slurry, and a mixture of the foaming additive and the cement slurry is introduced into the first inlet of the dual phase mixture generator.

7. The method of claim 6, wherein the foaming additive is a foaming agent, a foam stabilizer, or a mixture thereof.

8. The method of claim 7, wherein the first container comprises two separate compartments, wherein a first compartment contains the foaming agent and a second compartment containing the foam stabilizer.

9. The method of claim 5, wherein the first container contains liquid nitrogen and the first pump pumps the liquid nitrogen from the first container into the second inlet of the dual phase mixture generator.

10. The method of claim 5, further comprising:

mounting a second container and a second pump on the transportable platform, wherein the second pump is operably connected with the second container;

wherein the first container contains a foaming additive and the first pump pumps the foaming additive to the cement generating equipment for mixing with the cement slurry produced therein, and a mixture of the foaming additive and the cement slurry is introduced into the first inlet of the dual phase mixture generator; and,

wherein the second container contains liquid nitrogen and the second pump pumps the liquid nitrogen from the second container into the second inlet of the dual phase mixture generator.

11. The method of claim 10, wherein the cement generating equipment comprises a high pressure pump and the foaming additive is pumped into a suction end of the high pressure pump.

12. The method of claim 10, wherein the transportable platform is mounted on a trailer or a vessel.

13. A system for generating high pressure dual phase mixture, the system comprising:

a transportable platform;

a dual phase mixture generator mounted on the transportable platform,

wherein the dual phase mixture generator comprises a mixing chamber connected with at least a first inlet, a second inlet, and a first outlet, and

wherein the first inlet is configured to receive a base fluid, under high pressure, the second inlet is configured to receive a gas under high pressure, the mixing chamber is configured to combine the base fluid and the gas to generate a high pressure dual phase mixture, and the outlet is configured to discharge the generated high pressure dual phase mixture; and

a first container and a first pump mounted on the transportable platform, wherein the first pump is operably connected with the first container.

14. The system of claim 13, wherein the transportable platform is mounted on a trailer or a vessel.

15. The system of claim 13, wherein the dual phase mixture is a foamed cement slurry, the base fluid is a cement slurry containing a foaming additive, and the gas is nitrogen.

16. The system of claim 15, wherein the cement slurry containing a foaming additive is produced by cement generating equipment, the equipment either mounted transportable platform, not mounted on the transportable platform, or partially mounted on the transportable platform.

17. The system of claim 16, wherein the first container contains the foaming additive selected from a foaming agent, a foam stabilizer, or a mixture thereof.

18. The system of claim 17, wherein the first container comprises two separate compartments, wherein a first compartment contains the foaming agent and a second compartment containing the foam stabilizer.

19. The system of claim 16, wherein the first container contains liquid nitrogen and the first pump pumps the liquid nitrogen from the first container into the second inlet of the dual phase mixture generator.

20. The system of claim 16, further comprising:

a second container and a second pump mounted on the transportable platform, wherein the second pump is operably connected with the second container;

wherein the first container contains a foaming additive and the first pump pumps the foaming additive to the cement generating equipment for mixing with the cement slurry produced therein, and a mixture of the foaming additive and the cement slurry is introduced into the first inlet of the dual phase mixture generator;

wherein the second container contains liquid nitrogen and the second pump pumps the liquid nitrogen from the second container into the second inlet of the dual phase mixture generator.

21. The system of claim 13, further comprising a control panel that monitors a condition of the apparatus and/or controls a process of generating high pressure dual phase mixture.

We claim:

1. A method of generating a high pressure dual phase mixture, the method comprising:

using at a wellsite a transportable platform that has a dual phase mixture generator, a first container, a first pump, a second container, and a second pump mounted thereon, where the dual phase mixture generator comprises a mixing chamber connected with a first inlet, a second inlet, and a first outlet, where the first pump is operably connected with the first container, and where the second pump is operably connected with the second container, by:

pumping, via the first pump, a foaming additive from the first container to cement generating equipment that produces a cement slurry;

mixing the foaming additive with the cement slurry to form a base fluid;

introducing the base fluid into the first inlet of the dual phase mixture generator under high pressure;

pumping, via the second pump, nitrogen from the second container, wherein the second container contains liquid nitrogen;

introducing the nitrogen into the second inlet of the dual phase mixture generator under high pressure;

combining the base fluid with the nitrogen in the dual phase mixing chamber to generate a high pressure dual phase mixture that comprises a foamed cement slurry; and

discharging the high pressure dual phase mixture via the outlet of the dual phase mixture generator.

2. The method of claim 1, further comprising introducing the high pressure dual phase mixture into a well at the wellsite.

3. The method of claim 1, wherein the foaming additive comprises a foaming agent, a foam stabilizer, or a mixture thereof.

4. The method of claim 3, wherein the first container comprises a first compartment and a second compartment that are separate from each other, wherein

the first compartment contains a foaming agent and the second compartment contains a foam stabilizer.

5. The method of claim 1, wherein the cement generating equipment comprises a high pressure pump and the foaming additive is pumped into a suction end of the high pressure pump.

6. The method of claim 1, wherein the transportable platform is mounted on a trailer or a vessel.

7. A system for generating high pressure dual phase mixture, the system comprising:

a transportable platform;

a dual phase mixture generator mounted on the transportable platform, wherein the dual phase mixture generator comprises a mixing chamber connected with a first inlet, a second inlet, and a first outlet, and wherein the first inlet is configured to receive a base fluid under high pressure, the second inlet is configured to receive a gas under high pressure, the mixing chamber is configured to combine the base fluid and the gas to generate a high pressure dual phase mixture, and the outlet is configured to discharge the high pressure dual phase mixture;

a first container and a first pump mounted on the transportable platform, wherein the first pump is operably connected with the first container; and

a second container and a second pump mounted on the transportable platform, wherein the second pump is operably connected with the second container,

wherein the first container contains a foaming additive and the first pump is configured to pump the foaming additive to cement generating equipment for mixing with a cement slurry that is produced by the cement generating equipment,

wherein the first inlet of the dual phase mixture generator is configured to receive a mixture of the foaming additive and the cement slurry as the base fluid,

wherein the second container contains liquid nitrogen, and

wherein the second pump is configured to pump nitrogen from the second container into the second inlet of the dual phase mixture generator.

8. The system of claim 7, wherein the transportable platform is mounted on a trailer or a vessel.

9. The system of claim 7, wherein the cement generating equipment produces a cement slurry containing the foaming additive.

10. The system of claim 9, wherein the first container contains the foaming additive, which is a foaming agent, a foam stabilizer, or a mixture thereof.

11. The system of claim 10, wherein the first container comprises a first compartment and a second compartment that are separate from each other, wherein the first compartment contains a foaming agent and the second compartment contains a foam stabilizer.

12. The system of claim 7, further comprising a control panel that monitors a condition of the apparatus and/or controls a process of generating the high pressure dual phase mixture.