CLAIMS

1. A method for producing a liquefied first gas stream at a gas processing facility comprising:

(a) providing a first gas stream including nitrogen;

(b) providing a liquefied second gas stream, where the second gas is different than the first gas and where the liquefied second gas stream is produced from the liquefaction of a second gas stream at a location that is different from the gas processing facility;

(c) splitting the liquefied second gas stream into at least a first liquefied second gas stream and a second liquefied second gas stream;

(d) reducing the pressure of the first liquefied second gas stream such that the pressure of the first liquefied second gas stream is less than that of the second liquefied second gas stream;

(e) liquefying the first gas stream to form a liquefied first gas stream by indirect heat exchange of the first gas stream with the first liquefied second gas stream and the second liquefied second gas stream in a single multi-stream heat exchanger that receives the first liquefied second gas stream and the second liquefied second gas stream, and where the first liquefied second gas stream and the second liquefied second gas stream exchange heat with the first gas stream at a cold end of the single multi-stream heat exchanger;

(f) vaporizing at least a portion of the first liquefied second gas stream to form a first second gas stream;

(g) vaporizing at least a portion of the second liquefied second gas stream to form a second second gas stream; and

(h) compressing at least one of the first second gas stream and the second second gas stream to form a compressed second gas stream.

2. A method for producing a liquefied nitrogen gas (LIN) stream at a liquid natural gas (LNG) regasification facility comprising:

(a) providing a nitrogen gas stream;

(b) providing at least two LNG streams where the pressures of each LNG stream are independent and different from each other;

(c) liquefying the nitrogen gas stream by indirect heat exchange of the nitrogen gas stream with the LNG streams in at least one heat exchanger, wherein the at least one heat exchanger is a single multi-stream heat exchanger that receives the at least two LNG streams, and where the at least two LNG streams exchange heat with the nitrogen gas stream at a cold end of the single multi-stream heat exchanger;

(d) vaporizing at least a portion of the two LNG streams to produce at least two natural gas streams; and

(e) compressing at least one of the two natural gas streams to form compressed natural gas.

3. The method of claim 1 or 2, wherein the nitrogen gas stream comprises greater than 70% nitrogen.

4. The method of claim 1 or 2, wherein the nitrogen gas stream is provided at a pressure greater than 50 psia.

5. The method of claim 1 or 2, further comprising compressing the nitrogen gas stream to a pressure of greater than 200 psia before being provided to the heat exchanger.

6. The method of claim 5, wherein the nitrogen gas stream is compressed to a pressure greater than 1000 psi.

7. The method of claim 2, wherein the LNG streams are produced at an LNG production facility that uses LIN as a sole refrigerant.

8. The method of claim 2, wherein at least one of the compressed natural gas streams is directed to a natural gas sales pipeline.

9. The method of claim 2, wherein at least one of the LNG streams is provided at a pressure that is between 50 to 200 psi.

10. The method of claim 2, wherein at least one of the at least two LNG streams is reduced in pressure to form reduced pressure LNG streams.

11. The method of claim 10, wherein the reduction in pressure of the LNG streams occurs

using one or more valves, one of more hydraulic turbines, or combinations thereof.

12. The method of claim 10, wherein at least one of the reduced pressure LNG streams has a pressure between 10 to 30 psi, optionally between 30 to 60 psi.

13. The method of claim 2, wherein at least one of the at least two LNG streams is pressurized using one or more pumps to form additionally pressurized LNG streams.

14. The method of claim 13, wherein at least one of the additionally pressurized LNG streams has a pressure equal to or greater than 800 psi, optionally equal to or greater than 1200 psi.

15. The method of claim 2, wherein the heat exchangers are brazed aluminum type heat exchangers, spiral wound type heat exchangers, printed circuit type heat exchangers, or combinations thereof.

16. The method of claim 2, wherein the temperature of at least one of the at least two natural gas streams is less than -50 °C, optionally less than -100 °C.

17. A method for producing a liquefied nitrogen gas (LIN) stream at a liquid natural gas (LNG) regasification facility comprising:

(a) providing a nitrogen gas stream;

(b) providing a liquefied natural gas (LNG) stream;

(c) splitting the LNG stream into at least a first, second, third, and fourth LNG stream;

(d) reducing the pressure of the first, second, and third LNG streams such that the pressure of the first LNG stream is from about l0 psia to about 35 psia, the pressure of the second LNG stream is from about 30 to about 60 psia, and the pressure of the third LNG stream is from about 50 to about 100 psia;

(e) liquefying the nitrogen gas stream to form a liquefied nitrogen stream by indirect heat exchange of the nitrogen gas stream with the first, second, third, and fourth LNG streams in a single multi-stream heat exchanger that receives the first, second, third, and fourth LNG streams and where the first, second, third and fourth LNG streams exchange heat with the nitrogen gas stream at a cold end of the single multi-stream heat exchanger;

(f) vaporizing at least a portion of the first, second, third, and fourth LNG streams; to form a first, second, third, and fourth natural gas stream; and

(g) compressing at least one of the first, second, third, or fourth natural gas streams to form a compressed natural gas stream.

18. The method of claim 17, where the LNG stream provided in step (b) is provided at a pressure of from about 14 psia to about 25 psia.

19. The method of claim 17, further comprising pressuring the LNG stream of step (b) to a pressure of from about 50 psia to about 200 psia before step (c).

20. The method of claim 17, further comprising increasing the pressure of the fourth LNG stream of step (c) to a pressure greater than 800 psia.

21. The method of claim 17, wherein the pressure of the nitrogen gas stream introduced to the heat exchanger in step (e) is at a pressure greater than 1000 psia.

22. The method of claim 17, wherein the temperature of the first, second, and third natural gas streams at the outlet of the heat exchanger is from -120 °C to -75 °C.

23. The method of claim 17, wherein the temperature of the fourth natural gas stream at the outlet of the heat exchanger is from -80 °C to -100 °C.

24. The method of claim 17, wherein the first LNG stream comprises less than 5% of the total LNG flow.

25. The method of claim 17, wherein the second LNG stream comprises less than 7% of the total LNG flow.

26. The method of claim 17, wherein the third LNG stream comprises less than 10% of the total LNG flow.