Claims

1. A method for large scale floating liquefaction of natural gas gathered from onshore gas pipeline networks, the method comprising:
    a) Gas gathering from on-shore pipeline quality gas sources (400) and treating the gas on shore by removal of mercury, removal of acid gas, dehydration and removal of C5+ hydrocarbons,
    b) compression and cooling of the treated gas;
    c) piping of the compressed gas from onshore (400) to an offshore platform (300);
    d) mixing the gas from onshore with a compressed recycle gas flow to obtain a compressed gas mixture;
    e) piping of the compressed gas mixture in sub-sea pipes (305) from the platform (300) to a floating liquefaction, storage and offloading vessel (200);
    f) distribution and introduction of the compressed gas mixture on the vessel (200), via a manifold (262), to two or more liquefaction modules (205, 205', 205'');
    g) withdrawing a side draw flow of the gas introduced into each liquefaction module (205, 205', 205''), expanding, and thereby cooling this gas flow in turbo expanders (218);
    h) cooling the remaining gas flow introduced into each of the liquefaction module (205, 205', 205'') to -10°C or lower by counter-current heat exchange with the expanded side draw gas from step g);
    i) using power from turbo expanders (218) in step g) to drive a compressor (220) compressing gas within an internal refrigerant circulation loop onboard the floating liquefaction, storage and offloading vessel (200);
    j) collecting expanded side draw gas flows from step g), after the heat exchange in step h), from each liquefaction module (205, 205', 205'') in a manifold and piping this gas to the offshore platform (300) as a recycle gas flow,

k) compressing the recycle gas flow on the platform (300), and cooling of the compressed recycle gas flow;

l) mixing the compressed recycle gas flow with the compressed gas from onshore corresponding to step d);

m) further cooling and liquefaction of the gas on the vessel (200), in each liquefaction module (205, 205', "05''), by heat exchange with pre-cooled and expanded refrigerant;

n) each liquefaction module (205, 205', 205'') is powered by a dedicated gas turbine (202, 202a-202e) for refrigerant compression;

o) introducing produced LNG in multiple membrane tanks.

2. The method of claim 1, wherein the method further comprises offloading of LNG onto tank vessel (209, 209a-e), side by side offloading while the liquefaction processes are in full production, by means of vessel offloading arms (207, 207') located on opposite side of the positioning of cantilever and air coolers (201).

3. The method of claim 1 or 2, wherein all cooling and intercooling of compressed refrigerant in the liquefaction modules is carried out in air coolers (201).

4. The method of claim 2, wherein the air coolers (201) are arranged on cantilevers extending along at least 50% of the vessel length and mounted on one side of the vessel (200) only.

5. The method of claim 1, wherein the refrigerant is nitrogen.

6. The method of claim 1, wherein the cooling in step k) is carried out in air cooler(s) (201).

7. The method of claim 1, wherein the distance between the vessel (200) and the offshore platform (300) is from 1000 to 20000 meters.