CLAIMS

1. A method of producing liquefied natural gas (LNG), comprising:
forming an LNG production train by matching a standardized single compression string to a refrigerant heat exchanger system and to a heat rejection system,
wherein the standardized single compression string consists of
a multi-shaft gas turbine with an output shaft operating a speed below 4,000 rpm, and
no more than three standardized compressor bodies, each of the compressor bodies being applied to one or more refrigeration compressors employed in one or more refrigerant cycles;
wherein the standardized single compression string is designed for a range of feed gas compositions and ambient temperatures
wherein the multi-shaft gas turbine comprises a large scale multi-shaft gas turbine having a maximum power output larger than 70 megawatts;
using the standardized single compression string, producing LNG where the refrigerant heat exchanger system and heat rejection system are designed for the range of feed gas compositions and ambient temperatures and are installed in locations and facilities without substantial reengineering and modifications.

2. The method of claim 1, wherein the LNG production train is a first LNG production train, and further comprising forming one or more additional LNG production trains identical to the first LNG production train, to thereby produce LNG.

3. The method of claim 1, wherein the standardized single compression string is a first standardized single compression string, and further comprising:
matching one or more additional standardized single compression strings to the refrigerant heat exchanger system and to the heat rejection system, to thereby produce a single LNG production train capable of producing LNG.

4. The method of claim 3, wherein the first standardized single compression string and the one or more additional standardized single compression strings combine to produce LNG at a rate of at least 3.2 million tons per annum.

5. The method of claim 1, further comprising using an inherent speed turndown range of the multi-shaft gas turbine to:
start the one or more refrigeration compressors from rest,
bring the one or more refrigeration compressors up to an operating rotational speed, and
adjust compressor operating points to maximize efficiency of the one or more refrigeration compressors or efficiency of the LNG production train,
without assistance from electrical motors or variable frequency drives.

6. The method of claim 1, further comprising:
extracting heat from exhaust gases of the multi-shaft gas turbine, thereby increasing overall energy efficiency of the LNG production train.

7. The method of claim 1, further comprising: chilling air entering an inlet of the multi-shaft gas turbine, thereby maximizing natural gas throughput and/or efficiency of the LNG production train.

8. The method of claim 1, wherein the standardized single compression string has no gear box.

9. The method of claim 1, wherein the standardized single compression string includes a starter motor having a maximum power output of 5 MW.

10. The method of claim 1, wherein the one or more refrigerant cycles include one or more of a single mixed refrigerant cycle, a propane precooled mixed refrigerant cycle, and a dual mixed refrigerant cycle.

11. The method of claim 7, wherein the air is chilled using an inlet air chilling apparatus comprising a mechanical refrigeration system that is independent of the standardized single compression string.

12. The method of claim 11, wherein the air is chilled using an inlet air chilling apparatus comprising a mechanical refrigeration system that is integrated with the standardized single compression string, wherein the air entering the inlet of the multi-shaft gas turbine is chilled using refrigerant compressed by one or more of the refrigeration compressors of the standardized single compression string.

13. The method of claim 1, wherein the multi-shaft gas turbine comprises a gas turbine with a free power turbine.

14. The method of claim 1, wherein the one or more refrigeration compressors are a centrifugal compressor or an axial compressor.

15. The method of claim 1, wherein the standardized compression string has no helper driver.