CLAIMS

1. An exhaust gas recirculation (EGR) gas turbine system, comprising:

an exhaust gas compressor positioned along an EGR path and configured to compress only a recirculated exhaust gas to produce an exhaust gas diluent, wherein the exhaust gas compressor comprises an inlet section comprising a flow control element comprising a plurality of inlet guide vanes configured to modulate a flow of the recirculated exhaust gas into the exhaust gas compressor based on a position of the flow control element, wherein the position of the flow control element is capable of ranging from a maximum open position to a minimum open position;

a recycle blower positioned along the EGR path and upstream of the exhaust gas compressor, wherein the recycle blower is configured to provide the flow of recirculated exhaust gas to the inlet section, wherein the flow of recirculated exhaust gas ranges from a minimum blower output to a maximum blower output; and

a controller coupled to the flow control element and to the recycle blower, wherein the controller is configured to control the position of the flow control element based on a measured or modeled parameter of the EGR gas turbine system, wherein the controller is configured to control one or more operational parameters of the recycle blower to control the flow of recirculated exhaust gas to the inlet section based on the position of the flow control element.

2. The EGR gas turbine system of claim 1, wherein the controller is configured to control the one or more operational parameters of the recycle blower to control the flow of recirculated exhaust gas to the inlet section based on the position of the flow control element relative to the maximum open position.

3. The EGR gas turbine system of claim 1, wherein the measured or modeled parameter comprises an exhaust temperature, a firing temperature, or a combination thereof, of the EGR gas turbine system.

4. The EGR gas turbine system of claim 1, wherein the minimum open position is based on a stall limit of the exhaust gas compressor and a minimum open limit of the flow control element, and wherein the maximum open position is based on a maximum open limit of the flow control element.

5. The EGR gas turbine system of claim 1, wherein the minimum blower output is based on a stall limit of the recycle blower, a minimum pressure limit of the recycle blower, and a minimum pressure rise limit of the recycle blower, and wherein the maximum blower output is based on a maximum pressure limit at the inlet section.

6. The EGR gas turbine system of claim 1, wherein the recycle blower comprises a plurality of blower vanes, and wherein the one or more operational parameters comprise a pitch of the plurality of blower vanes, rotational speed of the recycle blower, an amount of electrical power applied to the recycle blower, or a combination thereof.

7. The EGR gas turbine system of claim 1, comprising a turbine combustor configured to combust a fuel in the presence of an oxidant and the exhaust gas diluent at an equivalence ratio between approximately 0.95 and 1.05.

8. The EGR gas turbine system of claim 1, wherein the controller is configured to control the one or more operational parameters of the recycle blower to control the flow of recirculated exhaust gas to the inlet section such that the position of the flow control element generally remains at a set point position.

9. The EGR gas turbine system of claim 8, wherein the flow control element is configured by the controller to generally remain at the set point position until the flow of exhaust gas is set to the minimum blower output or the maximum blower output by the controller.

10. The EGR gas turbine system of claim 8, wherein the set point position is greater than approximately 75% of a range from the minimum open position to the maximum open position.

11. The EGR gas turbine system of claim 8, wherein the set point position is greater than approximately 90% of a range from the minimum open position to the maximum open position.

12. A method of controlling an exhaust gas recirculation (EGR) gas turbine system, comprising:

adjusting an angle of a plurality of inlet guide vanes of an exhaust gas compressor of the EGR gas turbine system, wherein the plurality of inlet guide vanes have a first range of motion defined by a minimum angle and a maximum angle, and wherein the angle is adjusted based on one or more monitored or modeled parameters of the EGR gas turbine system; and

adjusting a pitch of a plurality of blower vanes of a recycle blower disposed upstream of the exhaust gas compressor, wherein the plurality of blower vanes have a second range of motion defined by a minimum pitch and a maximum pitch, and the pitch of the plurality of blower vanes is adjusted based at least on the angle of the plurality of inlet guide vanes.

13. The method of claim 12, wherein adjusting the pitch of the plurality of blower vanes comprises adjusting the pitch of the plurality of blower vanes based on the angle of the plurality of inlet guide vanes relative to the minimum angle of the plurality of inlet guide vanes.

14. The method of claim 12, wherein the plurality of parameters comprise an exhaust temperature, a firing temperature of the EGR gas turbine system, or a combination thereof.

15. The method of claim 12, wherein the pitch of the plurality of blower vanes is adjusted based, at least in part, on a stall limit of the recycle blower, a minimum pressure limit of the recycle blower, and a minimum pressure rise limit of the recycle blower.

16. The method of claim 12, wherein adjusting the pitch comprises adjusting the pitch to enable the angle of the plurality of inlet guide vanes to substantially remain at a set point angle.

17. The method of claim 16, wherein the set point angle is less than approximately 20% of the first range of motion of the plurality of inlet guide vanes from the minimum angle to the maximum angle of the plurality of inlet guide vanes.

18. The method of claim 16, wherein the set point angle is approximately 5% of the range of motion of the plurality of inlet guide vanes from the minimum angle to the maximum angle of the plurality of inlet guide vanes.

19. The method of claim 16, comprising generally maintaining the angle of the plurality of inlet guide vanes at the set point angle until after the pitch of the plurality of blower vanes has been adjusted to the minimum pitch or the maximum pitch.

20. A non-transitory, computer-readable medium storing instructions executable by a processor of an electronic device, the instructions comprising:

instructions to adjust an angle of a plurality of inlet guide vanes of a compressor section of a gas turbine system based on one or more modeled or measured parameters of the gas turbine system, wherein the angle ranges from a minimum angle to a maximum angle; and

instructions to adjust a pitch of a plurality of blower vanes of a blower fluidly coupled to an inlet of the compressor section, wherein the pitch ranges from a minimum

pitch to a maximum pitch, wherein the pitch is adjusted based on the angle of the plurality of inlet guide vanes relative to the minimum angle.

21. The medium of claim 20, wherein the compressor section is a recycle compressor section and the blower is a recycle blower of an exhaust gas recirculation (EGR) turbine system.

22. The medium of claim 20, wherein the instructions adjust the pitch of the plurality of blower vanes to maintain a headspace between the angle of the plurality of inlet guide vanes and the minimum angle.

23. The medium of claim 22, wherein the headspace is less than or equal to approximately 10% of the range of the angle of the plurality of inlet guide vanes.

24. The medium of claim 22, wherein the headspace is less than or equal to approximately 5% of the range of the angle of the plurality of inlet guide vanes.