WHAT IS CLAIMED IS:

1. A method for treating at least one component of an installed and assembled gas turbine engine, the gas turbine engine comprising a core gas turbine engine, the method comprising:

operably locating a delivery assembly relative to an annular inlet of the core gas turbine engine, the delivery assembly being operably coupled to a control unit and a storage vessel containing a treating fluid;

atomizing a portion of the treating fluid with the delivery assembly to develop a treating mist, the treating mist comprising a plurality of atomized droplets;

suspending the atomized droplets of the treating mist within an airflow within at least one flow path of the core gas turbine engine, wherein the treating mist occupies a cross-sectional area of the at least one flow path to establish a simultaneous cross-sectional contact therein, wherein at least a portion of the atomized droplets remain suspended within the at least one flow path from the annular inlet to an axial position downstream of a compressor of the core gas turbine engine; and

depositing a portion of the treating mist onto the at least one component so as to wet at least 80% of an exposed surface of the at least one component.

2. The method of claim 1, wherein the atomized droplets have a median diameter of less than or equal to 5 microns and the treating mist has a fluid-to-air mass ratio of at least 0.025 and less than or equal to 5.0 kilograms of treating fluid to kilograms of air.

3. The method of claim 1, wherein a thermal state of the core gas turbine engine is less than or equal to 135% of an ambient air absolute temperature, and wherein the axial position downstream of the compressor is an axial position downstream of the installed and assembled gas turbine engine.

4. The method of claim 1, further comprising:

establishing a delivery temperature of the treating mist which increases a vapor content of the treating mist within the at least one flow path.

5. The method of claim 1, further comprising:

supplying a surge portion of the treating mist to the core gas turbine engine;

operably decoupling the delivery assembly from the annular inlet; and

establishing a soak period during which the treating fluid affects at least one of the at least one component and a deposit thereon.

6. The method of claim 1, wherein the delivery assembly comprises an array of nozzles, wherein each nozzle of the array of nozzles is configured to develop atomized droplets having a median diameter of less than or equal to 5 microns, the method further comprising:

actuating at least one nozzle of the array of nozzles to establish a treating mist volume, wherein the treating mist volume comprises a concentration of atomized droplets within a specified portion of the at least one flow path, the treating mist volume being characterized by a fluid-to-air mass ratio of at least 0.025 and less than or equal to 5.0 kilograms of treating fluid to kilograms of air.

7. The method of claim 6, further comprising:

obtaining environmental data, the environmental data comprising an ambient temperature, an ambient pressure, and an ambient humidity affecting the installed and assembled gas turbine engine;

obtaining data indicative of a thermal state of the core gas turbine engine; and

based on the environmental data and the data indicative of the thermal state of the core gas turbine engine, establishing the treating mist volume delivered to the annular inlet, wherein establishing the treating mist volume further comprises establishing a treating mist flow rate within the at least one flow path.

8. The method of claim 7, wherein further comprising:

monitoring an absolute humidity level at a point-of-departure from the installed and assembled gas turbine engine;

utilizing the monitored absolute humidity level to determine a percentage of the delivered treating mist remaining suspended at the point-of-departure from the installed and assembled gas turbine engine; and

adjusting the treating mist volume delivered to the annular inlet based on the determined percentage so as to achieve a desired level of wetting of the at least one component.

9. The method of claim 8, further comprising:

determining a first volume of treating fluid atomized and delivered as the treating mist to the annular inlet;

determining a second volume of treating fluid suspended at the point-of-departure from the installed and assembled gas turbine engine based on the monitored humidity level;

computing the portion of the first volume of treating fluid precipitated onto the at least one component based on a difference between the first and second volumes; and

adjusting the treating mist volume delivered to the annular inlet so that the second volume is less than or equal to 35% of the first volume.

10. The method of claim 1, wherein the delivery assembly comprises an array of nozzles, and wherein operably locating the delivery assembly relative to the annular inlet further comprises:

positioning the array of nozzles within a fan section of the gas turbine engine so that an outlet of each nozzle of the array of nozzles is arranged at an axial location between the fan section and the annular inlet of the core gas turbine engine; and

circumscribing the array of nozzles with at least one blocking element, wherein the at least one blocking element at least partially occludes an alternative flow path.

11. The method of claim 1, further comprising:

establishing a negative pressure differential between the annular inlet and a point-of-departure from the installed and assembled gas turbine engine, wherein the negative pressure differential draws a portion of the treating mist through the core gas turbine engine.

12. The method of claim 1, wherein operably locating the delivery assembly relative to the annular inlet of the core gas turbine engine further comprises operably coupling the delivery assembly to the annular inlet of the core gas turbine engine of an aircraft parked at a gate of an airport.

13. The method of claim 1, wherein treating the at least one component of the installed and assembled gas turbine engine is repeated at least once every 30 days.

14. The method of claim 1, further comprising:

establishing a treating cycle, wherein the treating cycle has a duration of 30 minutes or less; and

operably decoupling the delivery assembly from the annular inlet by a conclusion of the treating cycle.

15 The method of claim 1, wherein atomizing a portion of the treating fluid comprises atomizing less than 120 liters of treating fluid.

16. The method of claim 1, wherein the treating fluid comprises a cleaning fluid, wherein the treating mist is a cleaning mist, and wherein the method further comprises:

dissolving at least a portion of a deposit on the at least one component so as to remove the deposit.

17. The method of claim 1, wherein the treating fluid comprises a corrosion inhibitor, the corrosion inhibitor being a catalyst configured to react with at least one identified contaminant so as to inhibit corrosion of the at least one component.

18. The method of claim 1, wherein the treating fluid comprises a sealant configured to preclude a contact between a contaminant and the at least one component.

19. The method of claim 1, wherein atomizing the portion of the treating fluid further comprises:

atomizing the portion of the treating fluid via a vibrating mesh nebulizer so as to develop the plurality of atomized droplets having a median diameter of at least 2 microns and less than or equal to 5 microns.

20. The method of claim 1, further comprising:

treating an internal passage of the at least one component via penetration of the internal passage by the atomized droplets, wherein penetration of the internal passage removes at least a portion of a deposit therein.

21. The method of claim 1, wherein the core gas turbine engine has an absence of engine-powered rotation during the treating.