launcher via the one or more drainer of the launcher. The launcher can include a plurality of wheels to maneuver the launcher for coupling to the vertical side of the tank. The autonomous vehicle can include at least one sensor, at least one propeller, at least one ranging device, and at least one inspection device.

[0019] There is disclosed a method of recovering a vehicle from a tank containing a flammable fluid. The method can include loading, via a second side of a launcher, an autonomous vehicle into the launcher. The autonomous vehicle executing an exit procedure in response to terminating tank inspection procedures. The method can include closing, subsequent to loading the autonomous vehicle into the launcher, a gate valve to seal the autonomous vehicle in the launcher. The method can include releasing, by a drainer of the launcher, the flammable fluid from the launcher. The method can include triggering, by a pressure switch of the autonomous vehicle responsive to a decrease in pressure below a threshold caused by the release of the flammable fluid from the launcher, the autonomous vehicle to enter a power off state. The method can include removing a lid from a first side of the launcher subsequent to releasing the flammable fluid from the launcher. The method can include recovering the autonomous vehicle from the first side of the launcher.

[0020] The vehicle can exit the tank containing a flammable fluid via a manway of the tank. The vehicle can be loaded into the launcher subsequent to exiting the tank. The launcher, the gate valve, or the tank may include at least one source to indicate the location of the manway. The vehicle can identify the location of the manway by detecting the at least one source using one or more sensors of the vehicle. The vehicle can position and move through the manway using one or more sensors. The vehicle can be terminated or shutdown in response to the vehicle entered the launcher. The instruction to terminate tank inspection can be responsive to the vehicle completing the tank inspection, a timeout, or an indication to abort operation. The indication to abort operation may be received from an external device.

[0021] The vehicle can be cleaned prior to being removed from the launcher. The launcher may include the one or more vents to provide additional substance to the launcher. The additional substance can further remove remaining flammable fluid from the vehicle and the launcher. The

launcher can include the drainer to remove the additional substance and the remaining flammable fluid from the launcher. The vehicle may be retrieved from the launcher subsequent to removing the remaining flammable fluid from the launcher.

[0021A] At least one aspect is directed to a system for inspecting a tank containing a flammable fluid. The system can include a launcher comprising a first end and a second end. The first end having a lid configured to be opened, and the second end having a gate valve configured to couple the launcherto a vertical side of the tank containing the flammable fluid. The system can include an autonomous vehicle comprising a data processing system and a memory, the autonomous vehicle configured to be loaded into the launcher via the first end of the launcher and detect an increase in a pressure within the launcher having the autonomous vehicle loaded therein via the first end based on the flammable fluid being released into the launcher and the lid being replaced at the first end. The system can include one or more processors programmed to cause the autonomous vehicle to launch from the launcher into the tank to perform a tank inspection process based on the increase in the pressure within the launcher and the gate valve being opened.

What is claimed is:

1. A method of inspecting a tank containing a flammable fluid, comprising:

providing a launcher having a first end and a second end distal from the first end;

coupling, via a gate valve, the second end of the launcher to a vertical side of the tank containing the flammable fluid, the launcher comprising a lid at the first end;

removing the lid from the first end of the launcher;

loading, via the first end of the launcher, an autonomous vehicle into the launcher;

replacing, subsequent to loading the autonomous vehicle, the lid on the first end of the launcher;

increasing a pressure within the launcher having the autonomous vehicle by releasing the flammable fluid into the launcher;

opening the gate valve; and

launching the autonomous vehicle from the launcher into the tank to perform a tank inspection process.

2. The method of claim 1, further comprising:

navigating the autonomous vehicle from the tank to the launcher for retrieval;

subsequent to the autonomous vehicle navigating from the tank to the launcher for retrieval, closing the gate valve at the second end of the launcher to seal the tank from the launcher;

draining, via one or more drainers of the launcher, the flammable fluid from the launcher; and

removing the lid at the first end of the launcher to retrieve the autonomous vehicle from the launcher.

3. The method of claim 1, wherein increasing the pressure comprises increasing the pressure within the launcher to above a threshold by releasing the flammable fluid into the launcher, the pressure within the launcher increasing to above a threshold triggering a pressure switch of the autonomous vehicle to cause it to enter a powered state.

4. The method of claim 1, further comprising:

navigating, by the autonomous vehicle, from the launcher into the tank to perform the tank inspection process; or

filling the launcher with inert gas prior to releasing the flammable fluid.

5. The method of claim 1, further comprising:

removing a lid from a manway located at the vertical side of the tank;

coupling the gate valve, while closed, to the manway of the tank, and loading the tank with the flammable fluid.

6. The method of claim 1, further comprising:

providing a manway adapter having a first side comprising a first gate valve, and a second side coupled to the vertical side of the tank.

7. The method of claim 1, further comprising:

receiving, by the autonomous vehicle, a command to terminate the tank inspection process;

identifying, by the autonomous vehicle, an indicator located in a portion of the launcher; and

navigating, by the autonomous vehicle responsive to identifying the indicator, from the tank to the launcher.

8. The method of claim 1, further comprising:

closing the gate valve subsequent to the autonomous vehicle navigating from the tank to the launcher;

removing the flammable fluid from the launcher; and

removing the lid on the first end of the launcher to retrieve the autonomous vehicle from the launcher.

9. The method of claim 8, wherein subsequent to the flammable fluid being removed from the launcher, the method further comprises:

refilling the tank with the flammable fluid from the launcher.

10. The method of claim 8, wherein subsequent to the flammable fluid being removed from the launcher, the method further comprises:

releasing a cleaning solution into the launcher via a vent of the launcher; and

draining the cleaning solution from the launcher.

11. The method of claim 1, wherein loading comprises:

loading into the launcher, via the first end of the launcher, a plurality of autonomous vehicles.

12. A system for inspecting a tank containing a flammable fluid, comprising:

a launcher comprising a first end and a second end, the first end having a lid configured to be opened, and the second end having a gate valve configured to couple the launcher to a vertical side of the tank containing the flammable fluid;

an autonomous vehicle comprising a data processing system and a memory, the autonomous vehicle configured to be loaded into the launcher via the first end of the launcher and detect an increase in a pressure within the launcher having the autonomous vehicle loaded therein via the first end based on the flammable fluid being released into the launcher and the lid being replaced at the first end;

one or more processors programmed to cause the autonomous vehicle to launch from the launcher into the tank to perform a tank inspection process based on the increase in the pressure within the launcher and the gate valve being opened.

13. The system of claim 12, wherein the launcher further comprises one or more drainers that drain the flammable fluid from the launcher based on the gate valve at the second end closing to retrieve the autonomous vehicle from the launcher.

14. The system of claim 12, wherein the one or more processors are further programmed to cause the autonomous vehicle to launch from the launcher into the tank to perform the tank inspection process based on the gate valve being opened.

15. The system of claim 12, wherein the autonomous vehicle comprises a pressure switch configured to:

detect a pressure within the launcher; and

based on the pressure having increased above a threshold caused by the flammable fluid being released into the launcher, trigger the autonomous vehicle to enter a powered state.

16. The system of claim 12, wherein the one or more processors are further programmed to:

navigate the autonomous vehicle from the launcher into the tank to perform the tank inspection process.

17. The system of claim 12, further comprising:

a manway adapter having a first side comprising a first gate valve, and a second side coupled to the vertical side of the tank.

18. The system of claim 12, wherein the one or more processors are further programmed to:

responsive to receiving a command to terminate the tank inspection process, cause the autonomous vehicle to identify an indicator located in a portion of the launcher; and

navigate the autonomous vehicle from the tank to the launcher based on the indicator.

19. The system of claim 12, wherein the launcher further comprises a vent configured to drain a cleaning solution released into the launcher via the vent.

20. The system of claim 12, wherein the launcher comprises a plurality of wheels to maneuver the launcher to couple to the vertical side of the tank.