Procedure to Inhibit Sprinkler Pipe Corrosion

1. Install the nitrogen generation system and related accessories per the manufacturer's recommendations

2. Spot check 10% of the sprinkler pipe couplings
    a. Look for particulate build up between couplings
    b. If a magnitude of particulate is identified within those couplings, all gaskets should be cleaned on location with a wire brush or replaced (note: these are inexpensive components and designed to be easily interchanged)

3. Static (air) test the sprinkler system
    a. Close valve on all Auto Purge Systems at this point in the procedure
    b. Note: The nitrogen generator's air compressor package can provide up to 175 PSI for the static testing
    c. Leak testing the Fire Protection System (FPS): Check that pressure isn't dropping more rapidly than outlined in the NFPA 13 Standards for the Installation of Sprinkler Systems (new installations) or in the NFPA 25 Standards for the Inspection, Testing, and Maintenance of Water Based FPS (existing FPS systems)
    d. Replace any sprinkler pipe or clean/replace any coupling that has an air leak

4. Flush the sprinkler system
    a. Run pressurized water rapidly through the sprinkler piping per NFPA 25 flushing procedures (this will help to remove scaling, tuberculation and other debris)

5. Hydrotest the sprinkler system
    a. Fill the sprinkler piping with pressurized water and hold pressure (i.e. this can help reveal an unexposed pinhole that may be 95% through the pipe wall)
        i. Replace any section of sprinkler pipe that is leaking

6. Trip test the sprinkler system
    a. Run water to ensure that the hydraulic calculations are still valid (i.e. check to ensure that water reaches the inspectors test valve within 60 seconds of trip)
        i. If not, replace the pipe/piping that is obstructing or decelerating the water

7. Bring Nitrogen generation system online
    a. Close all valves upstream of the Air Maintenance Device/s
    b. Complete the air compressor startup procedures as outlined in the air compressor Installation & Operation manual
        i. Once operational, observe (green) air receiver tank pressure
            1. Cut In Pressure - ~ 120 PSI
            2. Cut Out Pressure - ~ 175 PSI
        ii. Open valve after air receiver tank to flow air through the air dryer
            1. Check that the air dryer is in operation (green light is lit)
        iii. Open valve to the Nitrogen generator
            1. Check to see that a minimum of 120 PSI is showing on the pressure gauge, which is located on the face of the red cabinet
        iv. Check Nitrogen generator
            1. Observe (red) nitrogen receiver tank pressure
                a. Nitrogen generator Cut In Pressure - ~ 70 PSI
                b. Nitrogen generator Cut Out Pressure - ~ 80 PSI
            2. Check that either the green (operate) or amber (standby) light is lit
    c. Open all valves upstream of the Air Maintenance Device/s except the air bypass valve
        i. Check that incoming (nitrogen) pressure is available at the Air Maintenance Device/s
    d. Leak test the fittings and lines between all nitrogen generation system components

8. Pressurize the sprinkler systems
    a. Close valve on Nitrogen receiver tank (red)
    b. Open Air Bypass Valve
    c. Run a 2nd static (air) test on the sprinkler system
        i. Note: The nitrogen generator's air compressor package can provide up to 175 PSI for the static testing
        ii. Leak testing the Fire Protection System (FPS): Check that pressure isn't dropping more rapidly than outlined in the NFPA 13 Standards for the Installation of Sprinkler Systems (new installations) or in the NFPA 25 Standards for the Inspection, Testing, and Maintenance of Water Based FPS (existing FPS systems)
        iii. Replace any sprinkler pipe or clean/replace any coupling that has an air leak
        iv. After static (air) test, drop pressure back to supervisory pressure

9. Calibrate the Auto Purge System
    a. Open the valve on each Auto Purge System so that air flows though the device
    b. Observe the chart on the back of the Auto Purge System (APS) for the proper flow rate setting (setting is based on gallons within each Dry sprinkler system). To set the APS, adjust the needle valve to move the bead on the integrated flow meter to the corresponding value shown on the APS chart.

10. Close the air bypass valve on the Nitrogen generator and open all other valves (upstream of the air maintenance device) to ensure that Nitrogen is flowing into the Dry sprinkler systems

11. Two weeks after bringing the nitrogen generation system online, visit the site to confirm nitrogen purity levels
    a. Attach a portable Nitrogen purity sensor to each APS to quickly check that 98% or greater Nitrogen purity is fully blanketed throughout the Dry sprinkler systems
    b. Locate the hours meter on the side of the nitrogen generator to confirm that it has endured less than 50 hours of run time

12. Notes regarding ongoing fire protection system maintenance
    a. Pinhole Leaks
        i. A pinhole leak can occur shortly after the Nitrogen generation system has been brought online. The static (air) test, flushing and hydrotest procedures are intended to reveal all leaks, however, there may be areas in which the pipe wall is extremely close to - yet not degradated enough to become a leak at the time of these procedures. Once the system is introduced to 98%+ pure Nitrogen, the corrosion process is arrested and the frequency of pipe replacement significantly diminishes going forward.
    b. System Trips
        i. The nitrogen generation system will introduce nitrogen, which has a low dew point, into the FPS. This prevents ice plugs and freeze-ups from occurring as a result of continual buildup of condensate in the low lying pockets of the FPS. However, in the event of an unscheduled system trip, the system must be drained immediately. Then, within a period of 2-4 weeks, the system should be drained again to remove any residual water that has filtered down to the low points.

    c. Follow the manufacturer's recommendations for preventative maintenance