Ammonia Scrubber Preventive Maintenance Checklist

1. Liquid Distribution & Nozzle Integrity

- [ ] **Spray Pattern Verification:** Inspect the spray nozzles for uniform distribution across the top of the packing bed. Clogged nozzles lead to "channeling," where gas bypasses the scrubbing liquid entirely.
- [ ] **Nozzle Orifice Wear:** Check for erosion in nozzle orifices, especially in acid-based systems, as an enlarged orifice can disrupt the atomization required for high-surface-area contact.
- [ ] **Strainer Cleaning:** Clean the pump suction strainers to prevent debris from entering the recirculation loop and fouling the nozzles.

2. Packing Material Inspection

- [ ] **Fouling & Scaling Audit:** Check the random or structured packing for signs of mineral scaling (common in water systems) or biological growth. Scale increases pressure drop and reduces the available surface area for absorption.
- [ ] **Bed Settling:** Ensure the packing hasn't settled or shifted, which creates large voids (chimneys) in the tower that allow gas to pass through untreated.
- [ ] **Differential Pressure (Delta P) Monitoring:** Record the pressure drop across the bed. A significant increase typically indicates fouling or plugging of the packing.

3. Instrumentation & Chemical Control

- [ ] **pH Probe Calibration (Acid Systems):** Calibrate pH sensors weekly. If the pH rises too high in an acid scrubber, the neutralization reaction stops, and ammonia removal efficiency plummets.
- [ ] **Level Control Functionality:** Test the high and low-level switches in the sump. Ensure the automated make-up water valve and blowdown valves are actuating correctly.
- [ ] **ORP/Concentration Testing:** For water-based systems, periodically test the sump liquid concentration to ensure the blowdown rate is sufficient to prevent the water from reaching ammonia saturation.

4. Mechanical & Structural Components

- [ ] **Mist Eliminator Cleaning:** Inspect the chevron or mesh mist eliminator at the top of the stack. If it becomes clogged with salt or scale, it can increase fan backpressure and carry liquid droplets out the stack.
- [ ] **Blower/Fan Vibration Analysis:** Check the exhaust fan for vibration or unusual noise, which may indicate an imbalanced impeller due to chemical deposits.
- [ ] **Seal & Gasket Inspection:** Inspect all access hatches and flange gaskets for signs of "weeping" or salt crusting, which indicates a localized leak.