

Pre-Commissioning Checklist: Bulk Ammonia Unloading Systems

1. Mechanical & Structural Readiness

- **Foundation & Anchorage:** Verify all skid mounting bolts are torqued to specification and the foundation is level and free of cracks.
- **Breakaway Couplings:** Ensure emergency breakaway couplings are correctly oriented and the "pull-force" rating is appropriate for the site's mooring configuration.
- **Gasket Compatibility:** Confirm all flange gaskets are ammonia-rated (e.g., Spiral Wound 304/316 SS with Graphite filler) and no rubber or copper-based materials are present.
- **Flex Hose Integrity:** Inspect unloading hoses for "kinks," outer braid fraying, and valid hydro-test date tags.

2. Instrumentation & Safety Systems

- **ESD Loop Test:** Perform a "dry" function test of the Emergency Shutdown (ESD) system. Verify that pressing the local or remote ESD button closes the pneumatic shut-off valves in under 5 seconds.
- **Grounding & Bonding:** Test the continuity of the grounding reel. Ensure the "Interlock" prevents pump operation if the truck or railcar is not properly grounded.
- **Leak Detection:** Calibrate all ammonia sensors located at the unloading manifold and verify that alarms trigger the site-wide notification system.
- **Mass Flow Meter Calibration:** Ensure the meter is configured for the correct specific gravity of the reagent (Anhydrous vs. Aqueous) to ensure accurate custody transfer.

3. Piping & Valving

- **Pneumatic Supply:** Verify that the "Instrument Air" supply is dry, filtered, and at the required pressure (typically 80-100 psi) to operate the fail-safe valves.
- **Check Valve Orientation:** Confirm that backflow prevention valves are installed in the correct flow direction to prevent storage tank back-flow into the transport vessel.
- **Pressure Relief Manifold:** Ensure the three-way "transflow" valve is positioned correctly, ensuring at least one relief valve is always open to the system.

4. Operational & Personnel Readiness

- **SOP Availability:** Ensure the site-specific Standard Operating Procedures (SOPs) for "Normal Unloading" and "Emergency Disconnect" are posted at the skid.
- **PPE Audit:** Verify that two technicians are present with full ammonia-rated PPE, including respirators/SCBAs and chemically resistant gloves/suits.
- **Vapor Return Path:** Confirm the vapor return line to the storage tank is clear and unobstructed to prevent transport vessel over-pressurization.