



# CUSTODY TRANSFER FLOWMETER CALIBRATION CASE STUDY

An Interstates client that handles ammonia required annual custody transfer flowmeter calibrations at its facility to remain compliant with state requirements. The traditional method involved filling transport trucks and driving to a certified scale more than an hour away, extending the process across multiple days and creating measurement variability. Interstates identified an opportunity to improve efficiency and accuracy by implementing a state-certified master flowmeter and a closed-loop recirculation setup. This approach, the first of its kind in the state for ammonia handling, enabled on-site testing that significantly reduced time, improved accuracy, and enhanced operational safety.

## Modernizing Custody Transfer Proving

Custody transfer calibration verifies that the meters used in commercial transactions measure accurately and comply with state standards. For ammonia and other regulated products, this process ensures reliable billing, legal accountability, and accurate reconciliation between buyers and sellers. Interstates applied a master meter proving method that had been successfully used in other applications and adapted it to ammonia for the first time in this state. Through extensive pre-planning, equipment research, and early testing, the team developed a streamlined and repeatable approach that meets regulatory expectations while enhancing plant efficiency.



## Outcomes:



Reduced a multi-day proving process to approximately four hours.



Increased measurement accuracy and eliminated scale-related variability.



Enhanced safety by removing the need for transport trucks and off-site travel.



Delivered a consistent, on-site approach that state officials plan to recommend to other facilities.



## Challenges

1

### **Inefficient traditional process:**

The previous method required filling a truck, driving to a certified scale, and repeating the process over several days, increasing labor time and cost.

2

### **Limited measurement precision:**

Industrial truck scales provided coarse resolution, rounding to 20–50 pounds, and fuel consumption during transit created unavoidable variability in net product calculations.

3

### **Ammonia phase-change issues:**

Ammonia's low boiling point caused the product to shift between liquid and gas states during testing, affecting measurement stability.

4

### **Unfamiliar meter configuration:**

The facility used flowmeters, which required additional research to ensure proper adjustments and configuration.

## Solution

Interstates proposed replacing the truck-and-scale method with a state-certified master flowmeter and a closed-loop recirculation setup that returns product directly to storage. This approach allows the facility to complete all custody transfer calibrations on-site, eliminating logistical constraints and improving accuracy. The project team arrived ahead of the official testing date to run extended “wet-down” procedures, cooling hoses and equipment to

keep ammonia in a stable liquid state. Multiple test runs conducted the evening before helped confirm the setup, refine hose configurations, and validate meter compatibility. Interstates researched the plant's flowmeters, enabling efficient adjustments if needed. When state officials arrived, the system was ready for immediate proving, and the two-person team coordinated the testing seamlessly. No major real-time changes were required, and the meters verified well from factory calibration.

## Results

The updated proving method delivered significant operational benefits for the client. The team completed the calibration of all load-out meters in approximately four hours, compared to the several days required by the previous process. Eliminating transport trucks reduced labor needs, improved safety, and removed fuel-related measurement variability. The master meter's accuracy, which was better than 0.1 percent of rate, provided stronger confidence in measurement results and improved the reliability of custody transfer transactions. Both the client and state officials expressed high satisfaction with the speed, precision, and preparation demonstrated throughout the project. State regulators indicated they plan to recommend this approach for additional facilities, and the client expressed interest in applying the methodology at other locations.

## Going Forward

The client can now complete its annual custody transfer testing more efficiently, with reduced operational disruption and greater measurement reliability. The success of this engagement positions Interstates as a preferred provider for custody transfer calibration in the region, especially for facilities seeking safer, more accurate, and less labor-intensive proving methods. Lessons learned from this project – including the importance of thorough preplanning and early test runs – can be applied to similar implementations across additional products and sites.