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Petroleum Storage Best Practices

The operating disciplines that separate institutional-grade terminals from tank owners: measurement, segregation, reconciliation, release control.

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Any facility with steel and pumps can call itself a terminal. What distinguishes institutional-grade storage is a set of operating disciplines — mostly invisible from outside the fence — that determine whether product comes back in the quantity and quality it arrived. This article catalogs the practices cargo owners should expect, and audit for.

1. Measurement you can defend

Every custody figure should trace to a recognized standard (API MPMS chapters or ISO equivalents), calibrated instruments with current certificates, and calculation sheets a surveyor can re-perform. Best practice adds independence: witness rights for customer-appointed surveyors at every opening and closing measurement, and sealed retained samples as the physical tiebreaker for quality disputes.

2. Segregation as a system, not a promise

Cross-contamination is the most expensive routine failure in products storage. Robust terminals defend specification at three layers:

- **Hardware** — dedicated tank groups per product family; dedicated lines where practical; double block-and-bleed isolation at manifolds.
- **Procedure** — written, verified line-ups for every movement; interface management on shared lines; documented service-change protocols with cleaning verification.
- **Evidence** — first-foot samples on changed service, and testing before commingled or onward movement.

3. Daily reconciliation, not month-end surprises

Physical stock (gauged) and book stock (ledger) should meet daily, with gains and losses computed, trended and explained inside contractual tolerances. A terminal that reconciles daily can hand any customer a stock statement that survives audit; a terminal that reconciles monthly is describing history, not controlling inventory.

4. Tank integrity on a schedule

Storage tanks live on inspection cycles — in-service external inspections and periodic out-of-service internal inspections under API 653 or equivalent regimes, with floor thickness, shell corrosion, roof seals and foundations tracked over decades. Cargo owners rarely see this work, but its absence is how terminals fail suddenly. Asking for the inspection philosophy (not the raw reports) is a fair due-diligence question.

5. Overfill prevention, learned the hard way

The 2005 Buncefield explosion — a gasoline tank overfilled when level instrumentation failed — reshaped industry practice: independent high-level alarms separate from the working gauge, automatic overfill protection where risk assessment demands it, and defined maximum safe filling heights that operations respect even under commercial pressure. Any modern terminal should speak this language fluently.

6. Water, sludge and the unglamorous work

Crude and heavy products carry water and sediment that settle in tanks. Best practice drains water routinely (it corrodes floors and distorts quantity), manages sludge accumulation, and accounts for both honestly in quantity calculations rather than letting them silently become "losses."

7. Release control: the last line

Product should leave only against authenticated instructions from the entitled party — verified signatories, agreed communication channels, callback verification for high-value releases. The discipline sounds obvious; its



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occasional absence is behind most storage fraud stories. A terminal's release protocol deserves as much diligence as its tank specifications.

A one-page audit for cargo owners

Discipline	Ask to see
Measurement	Standard used, calibration status, surveyor witness policy
Segregation	Line-up procedure, service-change protocol
Reconciliation	A specimen daily stock statement
Integrity	Inspection philosophy and cycle
Overfill	Independent alarm & protection philosophy
Release	The written release/authentication protocol

Specific, written, current answers to these six lines are what "best practice" looks like from the customer's side of the fence.

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