



AIREZ for Foreign-Trade Zones (FTZ): Turning Compliance into Competitive Advantage

Executive summary

Foreign-Trade Zone (FTZ) operators carry unique obligations: continuous physical control of merchandise, auditable inventory accountability from admission through transfer, and robust site security. Regulations in **19 CFR Part 146** require traceable inventory movements, annual reconciliation, and operator liability for control systems, while CBP programs such as **CTPAT** elevate expectations for perimeter, access, and process integrity. [eCFR Legal Information Institute U.S. Customs and Border Protection+1](#)

AIREZ is a physical-AI platform that fuses video, fiber-optic, RF, and environmental sensors to generate **context-rich, real-time alerts** and **audit-ready evidence**. AIREZ does not replace your WMS/ICRS; it enhances it—watching the physical world and surfacing exceptions that jeopardize FTZ compliance, safety, and operations.

FTZ pain points AIREZ addresses

- **Physical custody & accountability gaps** (unattended docks, off-hour moves, tailgating) that can break the admission-to-transfer audit trail required under 19 CFR 146 Subpart B. [Legal Information Institute](#)
- **Perimeter & access risks** that undermine CTPAT posture (unsecured doors, tampering, loitering at fence lines, unescorted visitors). [U.S. Customs and Border Protection+1](#)
- **Liquid & bulk storage exposures** (overfills, leaks, sump alarms) that trigger environmental and **SPCC** obligations ($\geq 1,320$ gal above-ground oil storage). [Congress.gov US EPA](#)
- **Warehouse safety hazards** (forklift conflicts, blocked egress, missing PPE, battery-charging areas) that elevate OSHA risk and downtime. [OSHA+2 OSHA+2](#)



What AIREZ does (in plain terms)

- **Watches** cameras, access events, fiber-optic lines, RF tags, tank levels, temperature/humidity, vibration, and more.
- **Understands context** (who/what/where/when) to distinguish normal handling from anomalies.
- **Alerts in real time** (to radios, VMS, GSOC, email/SMS, or ticketing) and **documents automatically** for audits and investigations.
- **Deploys on-prem/air-gapped** for sensitive sites; no video leaves the facility unless you choose.

AIREZ **does not operate equipment or change setpoints**; it **observes, interprets, and alerts** (and can integrate with systems that take action).

Capability-to-requirement mapping (FTZ-focused)

FTZ / Program requirement	What AIREZ adds
Inventory accountability & traceability (19 CFR 146 Subpart B: admission, transfer, annual reconciliation)	Time-synced video + access + sensor evidence that correlates a physical move to a system move , flags unscheduled or after-hours motions, and preserves clips/metadata for the reconciliation file. Legal Information Institute
Operator liability & control system integrity (19 CFR 146)	Continuous exception monitoring around docks, cages, CFAs, FTZ boundaries; alerting on “move without system transaction” patterns to support ICRS integrity. eCFR
CTPAT facility security (perimeter, access, visitor control, cargo integrity)	Perimeter breach/loitering detection, tailgate detection, unattended package alerts, tamper cues, visitor path conformance, and zone-based muster validation. U.S. Customs and Border Protection+1
SPCC / liquid management (oil/chemical storage)	Tank level trending, high-level, leak and sump monitoring; sheen/leak visual cues; automatic incident log with clip, sensor values, time & location for the SPCC plan file. US EPACongress.gov

**FTZ / Program requirement****What AIREZ adds****OSHA warehouse safety**

(forklifts, charging, PPE, blocked aisles)

Forklift–pedestrian conflict alerts, battery-room procedure checks, PPE non-compliance cues, blocked egress detection; trend reports for training. [OSHA+1](#)

High-value FTZ use cases**1. Gate & dock exception detection**

- Detects unmanifested trailer access, dock-door open without ASN, pallet leaving cage without scan; aligns footage with WMS/ICRS transaction ID for audit packs. [Legal Information Institute](#)

2. Cage & high-value zone control

- Alerts on piggy-backing/tailgating, door props, time-in-zone violations, and unescorted visitors—boosting CTPAT readiness. [U.S. Customs and Border Protection](#)

3. Liquids & bulk monitoring (SPCC alignment)

- Tank overfill/leak prediction via level trends, temperature/pressure deltas, and floor-spill vision cues; instant incident dossier creation. [US EPA](#)

4. PPE & traffic safety

- Flags missing vests/helmets in forklift zones; detects wrong-way traffic or speed anomalies; archives events for toolbox talks. [OSHA](#)

5. Chain-of-custody verification for transfers

- Camera + access + scale + RF triangulation create a verifiable timeline from **admission to transfer/export**, supporting annual reconciliation. [Legal Information Institute](#)

6. Multi-site FTZ command view

- AIREZ federates sites into one GSOC view with common alert taxonomy, site benchmarking, and exception heatmaps.



Architecture & deployment

- **AIREZ Edge** (Titan/Pro/Lite/Micro) ingests local sensors and streams for on-prem analysis; supports **air-gapped** operation for highly controlled FTZs.
- **AIREZ Core** performs context analysis and event correlation; integrates with **VMS** (e.g., **Genetec**), WMS/ICRS, access control, and work-order tools.
- **AIREZ GSOC** provides dashboards, alert queues, and **exportable evidence packets** (video clip, sensor traces, access logs, timestamps).

Data retention, encryption, and role-based access controls can be aligned to your FTZ procedures manual and port director expectations. [eCFR](#)

Implementation roadmap (90 days to value)

1. **Readiness & rules:** map FTZ procedures (admission, storage, transfer) to AIREZ alert rules.
 2. **Sensor tie-in:** connect key cameras, door contacts, tank/level sensors, scales, RF readers.
 3. **Golden workflows:** define “good move” patterns; alert on deviations.
 4. **Pilot & tune:** reduce false positives; finalize evidence-pack format for audits.
 5. **Scale & standardize:** roll to additional bays, cages, and sites; enable GSOC federation.
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Measurable outcomes

- **Fewer compliance exceptions** (documented chain-of-custody; faster annual reconciliation). [Legal Information Institute](#)
- **Stronger CTPAT posture** (reduced tailgating, better perimeter awareness, auditable visitor flow). [U.S. Customs and Border Protection](#)
- **Lower environmental risk** (earlier leak/overfill detection; SPCC-aligned records). [US EPA](#)
- **Improved safety metrics** (reduced forklift/foot conflicts; PPE adherence). [OSHA](#)



- **Audit-ready evidence** (click-to-export incident bundles for CBP/port director review). [eCFR](#)
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Important note

This paper is informational and **not legal advice**. AIREZ supports your **ICRS and compliance program** by providing physical-world visibility, alerts, and evidence; operators remain responsible for meeting all requirements under **19 CFR Part 146** and related programs. Consult counsel and your CBP port director for site-specific obligations.

[eCFRU.S. Customs and Border Protection](#)

Let's talk

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