

PPE Compliance in Chemical Plants

Industry: Chemical Manufacturing

The Problem

A global chemical manufacturer wanted to ensure all workers wore Hazmat suits and respirators in "Zone 1" areas. However, union regulations and GDPR laws prohibited the streaming of recognizable faces to a central cloud or server for monitoring.

Solution

Klyff deployed a **Privacy-by-Design** safety agent. The AI processes the video stream locally, detects PPE compliance, and immediately "scrubs" (pixelates) all human faces at the source. Only a "Compliance Event" (a text alert) is sent to the cloud, never the raw video.

1. Hardware

- **Processor: NVIDIA Jetson Orin Nano** (deployed in ATEX-certified explosion-proof housing).
- **Connectivity:** Local 5G Private Network.

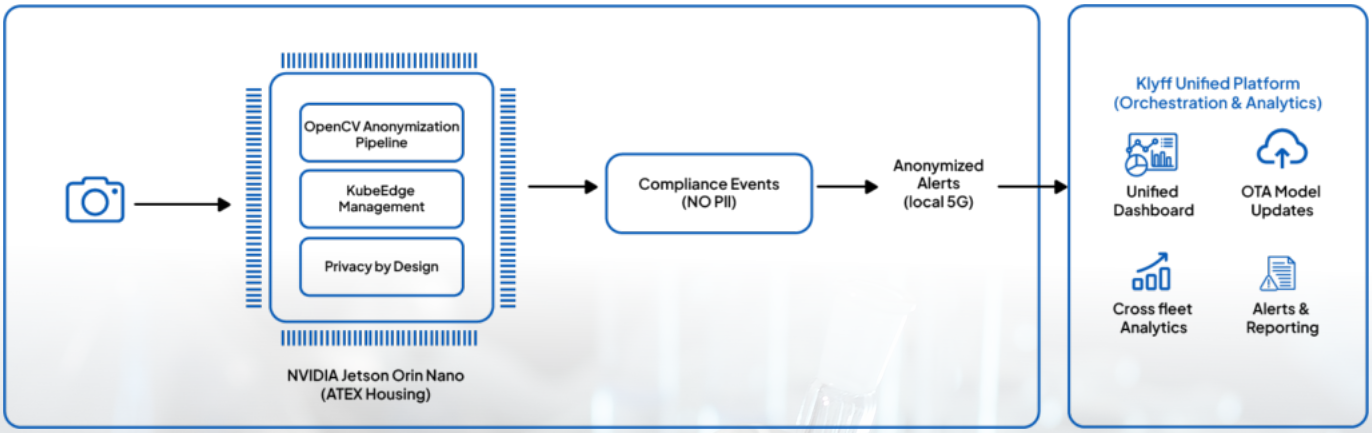
2. Software

- **Privacy Framework: OpenCV-based real-time anonymization pipeline.**
- **Management: KubeEdge** for managing 200+ safety nodes via the Klyff Platform.

Results

- No PII (Personally Identifiable Information) left the edge.
- Compliance: Reached 100% union approval
- Safety: Reduced safety incidents by 34% in the first six months by providing real-time audio alerts to workers missing gear.

Solution Flow





Klyff gives a significant advantage over traditional Cloud IoT

Feature	Traditional Cloud IoT	Klyff "Hard Tech" (Edge-First)	The Klyff Advantage
Response Latency	**200ms – 2 seconds** (Cloud Round-trip)	**< 10ms – 20ms** (On-Device Inference)	**10–50X Faster.** Essential for high-speed safety stops and robotics.
Data Transmission Costs	**High.** Constant streaming of raw sensor/video data.	**Near-Zero.** Only anomaly "events" are sent to the cloud.	**90% Cost Reduction.** Saves thousands in cloud egress and storage fees.
Data Privacy & Security	**High Risk.** Raw sensitive data travels over the public internet.	**Secure by Design.** Raw data never leaves the device; only insights move.	**GDPR/Union Compliant.** Ideal for worker monitoring and IP-sensitive zones.
Connectivity Reliance	System fails or "freezes" if Wi-Fi/4G drops.	**100% Autonomous.** Decisions continue even during network outages.	**Critical Reliability.** No downtime for remote mines or offshore assets.
Hardware Efficiency	Heavy data logging drains battery and bandwidth.	**Hardware-Optimized.** Uses NPUs/FPGAs to run AI at 10,000x higher efficiency.	**Extended Asset Life.** Models run on ultra-low-power $5–$20 chips.
Failure Detection	**Reactive.** Alerts you after a threshold is crossed.	**Proactive.** Identifies "micro-drifts" in machine behavior weeks earlier.	**True Predictive Maintenance.** Moves from "alerting" to "preventing."

Most IoT platforms are just "pipes" for data. Klyff is the **intelligence** at the end of the pipe. We focus on the **Silicon-to-Model optimization** unlike Cloud Dashboards

Let us help you with predictive maintenance

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