# VEGA SYSTEMS

*The Immune System for Video Infrastructure*

## EXECUTIVE SUMMARY

When the video stops at a seaport, operations stop. Modern container terminals rely on continuous live video for remote crane operations, automated gate management, and harbor traffic coordination. A single minute of video loss can halt crane movements, block truck lanes, and cascade into significant revenue losses.

Vega Systems provides a comprehensive suite of solutions that ensure 24/7 video availability: **RMF** for active-active redundancy, **SureStream** for direct camera-to-operator streaming, **Nidhi** for automated backup and recovery, **XPort** for zero-downtime migrations, and **Atlas** for secure wireless video transport from pilot boats and mobile assets.

# 1. The Seaport Video Challenge

Modern seaports are highly automated environments where video surveillance is not just a security tool—it is mission-critical infrastructure that directly enables operations.
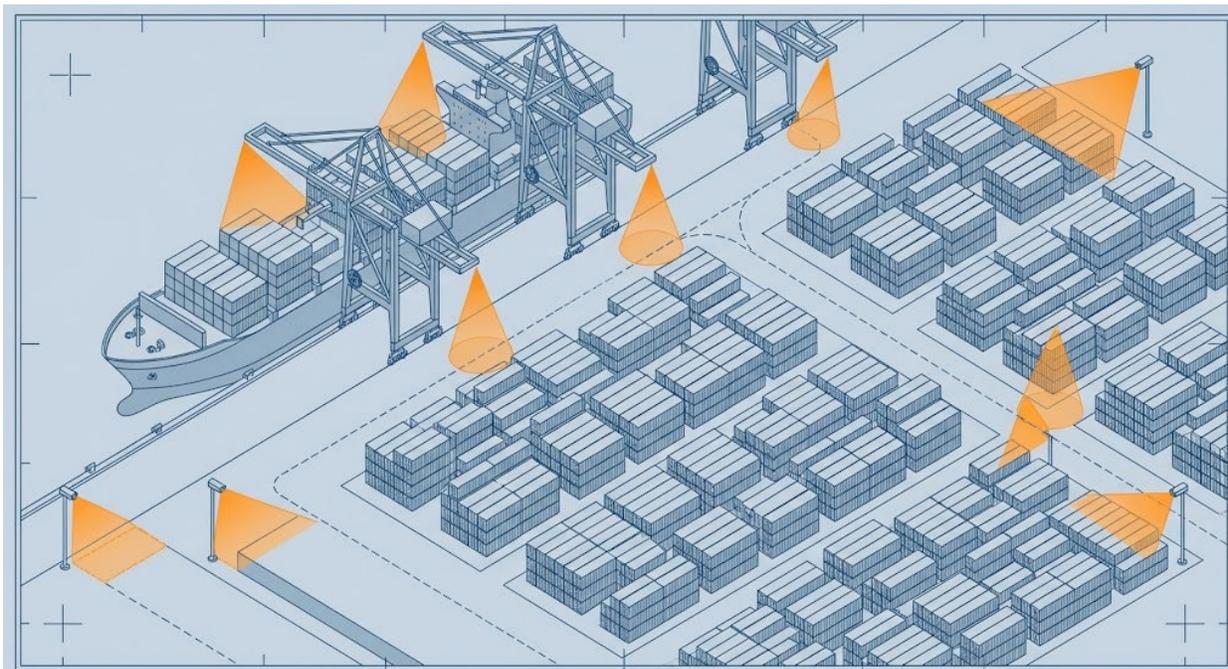


## Revenue is Measured in Moves Per Hour

Container terminals measure productivity in container moves per hour. Every operational process depends on live, latency-free video feeds:

- **Remote STS Crane Operations:** Operators controlling Ship-to-Shore cranes from remote stations require zero live-video failure.
- **Automated Gate Management:** traffic flow depends on video-based verification systems. Video loss blocks lanes and creates congestion.
- **Pilot Boat Operations:** Harbor pilots boarding container ships in challenging conditions need real-time video for safety documentation and coordination.
- **Customs & Inspection:** Federal agencies require complete video recordings for audits. Data loss creates compliance violations.

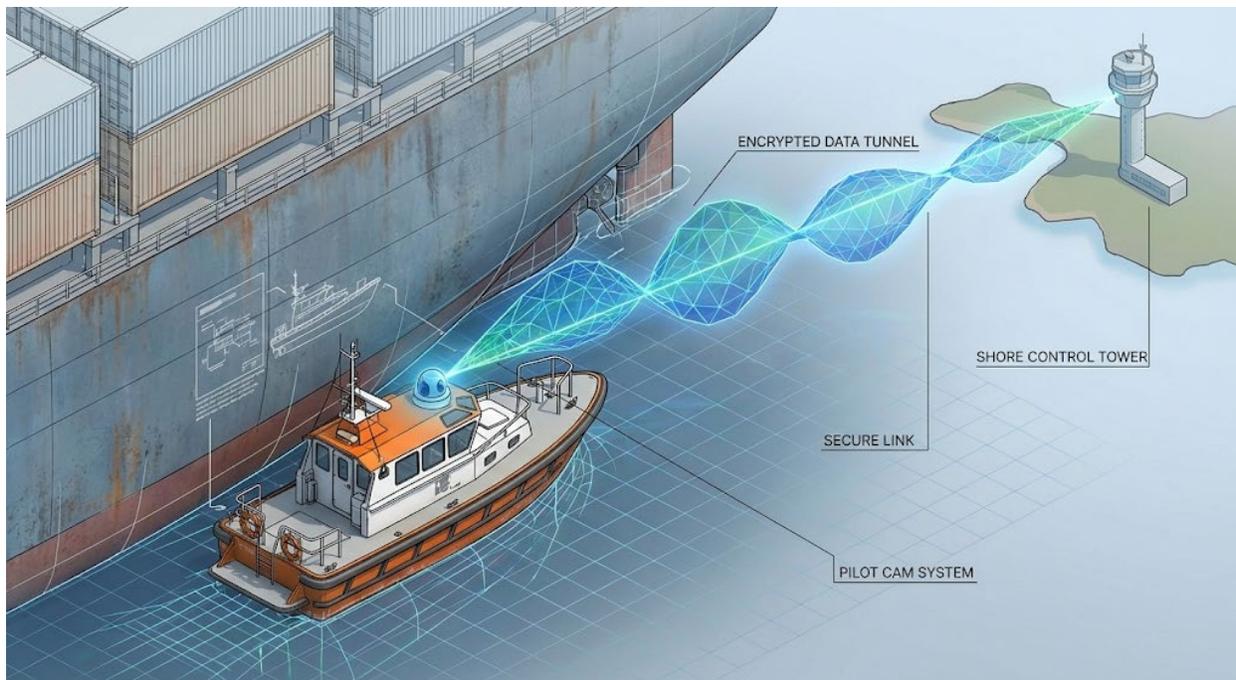| 60 seconds | 24/7/365 | ZERO |
|:---:|:---:|:---:|
| Traditional failover gap during which the liability exposure is 100% | Port operations never stop; downtime is not acceptable | Tolerance for data loss in customs and inspection areas |

# 2. Vega Systems Product Suite

Vega Systems offers a comprehensive suite of products designed to ensure continuous video availability for mission-critical environments. Each product addresses specific operational challenges faced by container terminals.

| PRODUCT | FUNCTION | SEAPORT APPLICATION |
|---------|----------|---------------------|
| **RMF** | Cybersecure Active-Active Redundancy for Milestone XProtect | Dual recording for gate and crane liability footage |
| **SureStream** | Direct Camera-to-Client Streaming (Bypasses VMS) | Remote crane operator live view continuity |
| **Nidhi** | Automated Media Backup & Restore to Cloud/SMB | Customs inspection footage compliance archival |
| **XPort** | Automated XProtect Migration & Consolidation | Zero-downtime infrastructure tech refresh |
| **Atlas** | Secure Video Transport Over Cellular/Wireless | Pilot boat and offshore operations video transport |

# 3. Seaport Use Cases by Operation

## 3.1 Pilotage Operations & Offshore



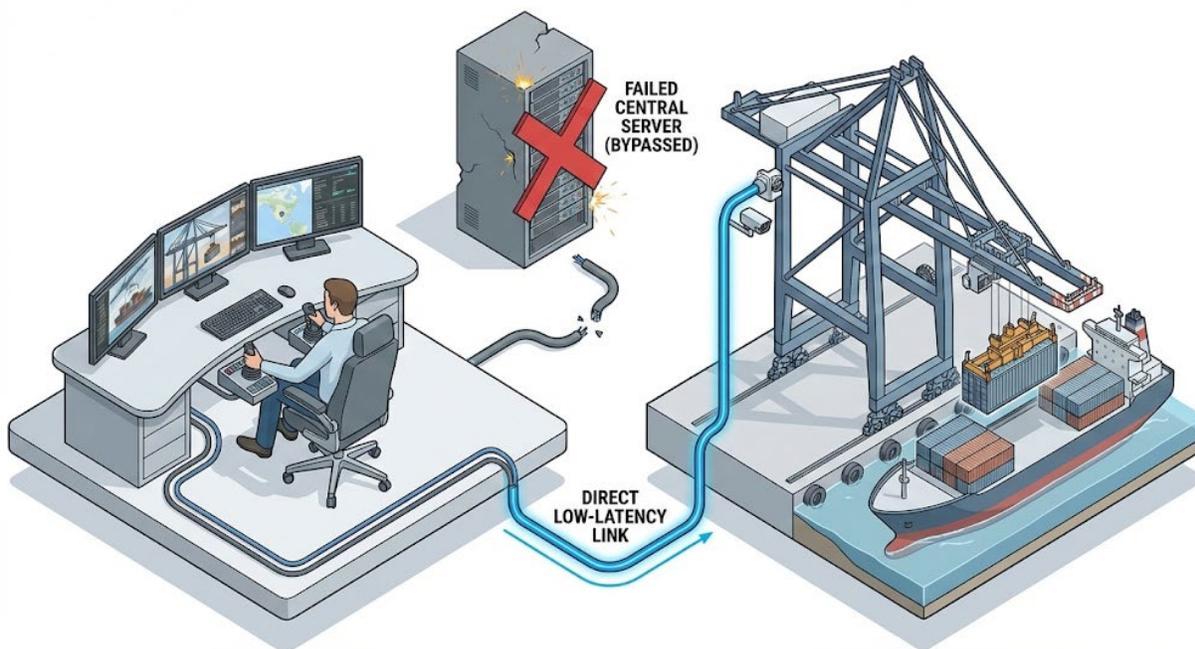| Product | Atlas |
|---|---|
| Challenge | Pilot boats operate in high-risk, high-liability moments: boarding large container ships at speed, in low visibility, and harsh sea states. Live video from vessels is critical for harbor control situational awareness, safety documentation, and operational coordination. |
| Solution | Atlas creates a secure, encrypted tunnel from pilot boat cameras to harbor control using cellular networks. The Outbound-Only Cloak architecture requires zero open ports, protecting vessels from cyber threats while delivering stable ONVIF video despite cellular jitter. |

**Key Benefits:**

- Harbor control gains real-time visibility on boarding operations, ship proximity, and traffic
- Video serves as objective evidence for boarding accidents, near misses, and insurance disputes
- Recorded footage enables review of pilot procedures and improves boarding techniques
- Shore teams can better coordinate tugboats, monitor weather impacts, and assist during emergencies
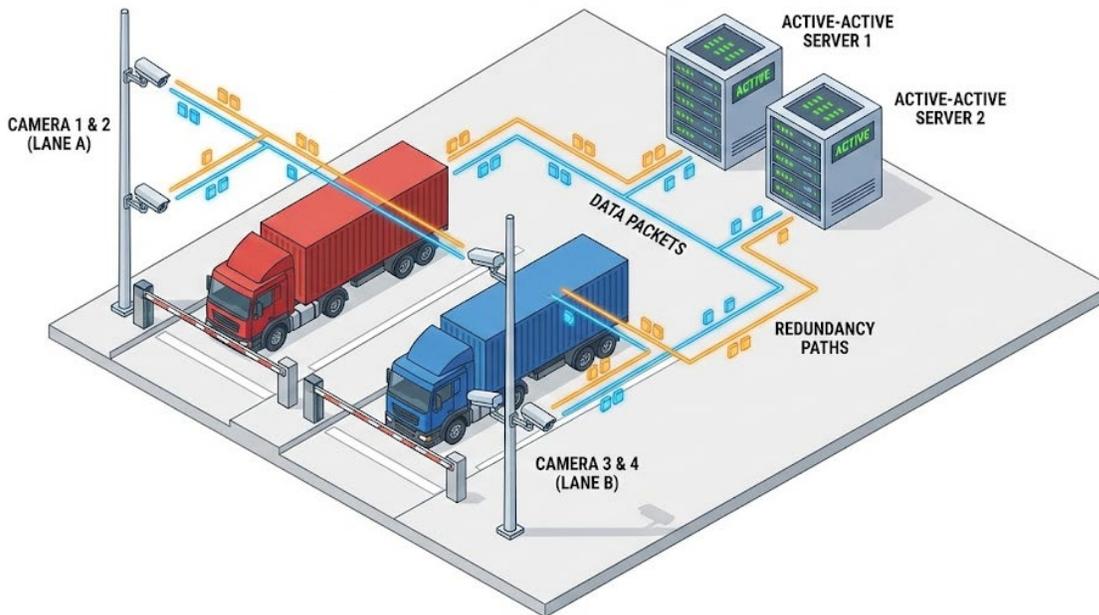
## 3.2 Remote Crane Operations (STS/RTG)



| Product | SureStream |
|---------|------------|
| Challenge | The operator is 1km away from the crane. If the video lags for 2 seconds, the container cannot be loaded safely. Remote control stations require near-zero latency. When the VMS server is patching, rebooting, or experiences any issue, the operator loses visibility. |
| Solution | SureStream provides a direct path from the crane camera to the operator's desk, bypassing the recording server. The ONVIF-compliant video client is embedded directly inside the XProtect Smart Client. Even if the VMS server is completely offline, the operator continues to move containers. |

### Critical Safety Scenario:

If the video cuts out while a container is suspended 30 meters in the air, that load is stuck. Operators cannot move it blindly. SureStream acts as a *live video insurance policy*, ensuring crane operators maintain visibility to safely land containers regardless of server status.
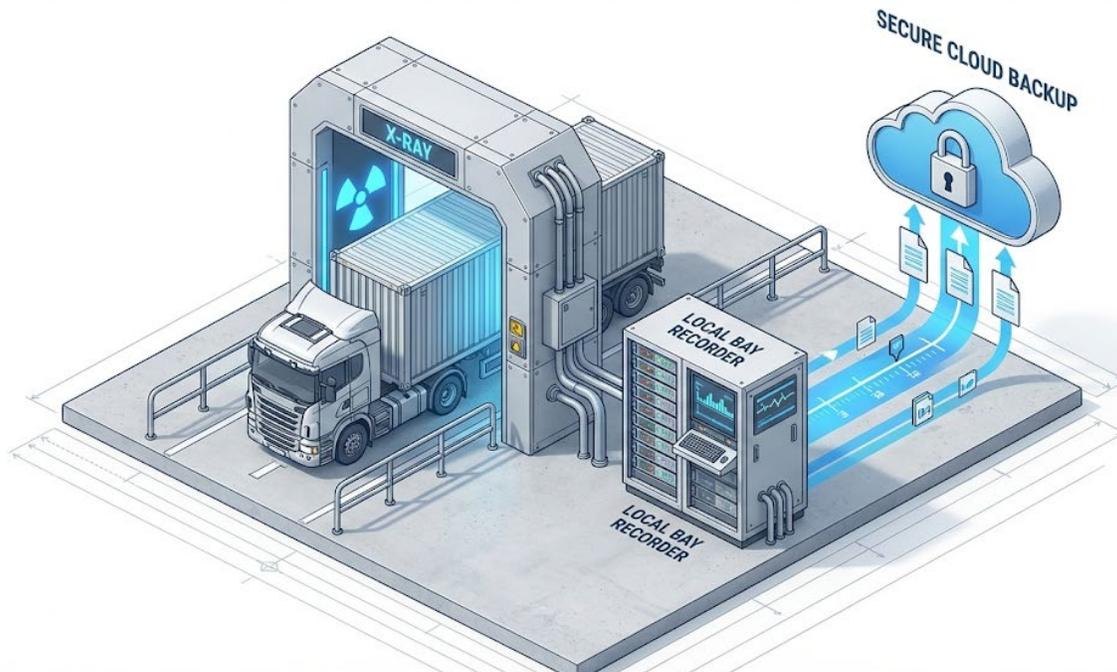
# 3.3 Gate & Crane Liability Recording



| Product | **RMF (Redundancy Management Framework)** |
|---------|-------------------------------------------|
| Challenge | Standard failover takes 60 seconds to kick in. In that minute, a container was dropped, and the port has zero footage to defend the claim. Traditional failover is reactive—it waits for a server to crash before starting a backup. During that failover gap, liability exposure is 100%. |
| Solution | RMF eliminates the gap with Dual Recording. Cameras stream to two servers simultaneously. If Server A stops, Server B has already captured the frame. Zero switching delay, zero blind spots, zero lost evidence. |

**RMF Key Features for Seaports:**

- **Cybersecure Object Synchronization:** Unlike traditional SQL replication that copies everything, including malware, RMF validates each change through Milestone's API
- **Active-Active Architecture:** Both data centers are fully operational 24/7, not just standing by
- **Automatic Playback Switching:** When playing back archived footage, content automatically loads from the redundant site if the primary is missing data
- **Client-Side Intelligence:** Detects failure events in each client window independently, providing the fastest live video recovery in the industry
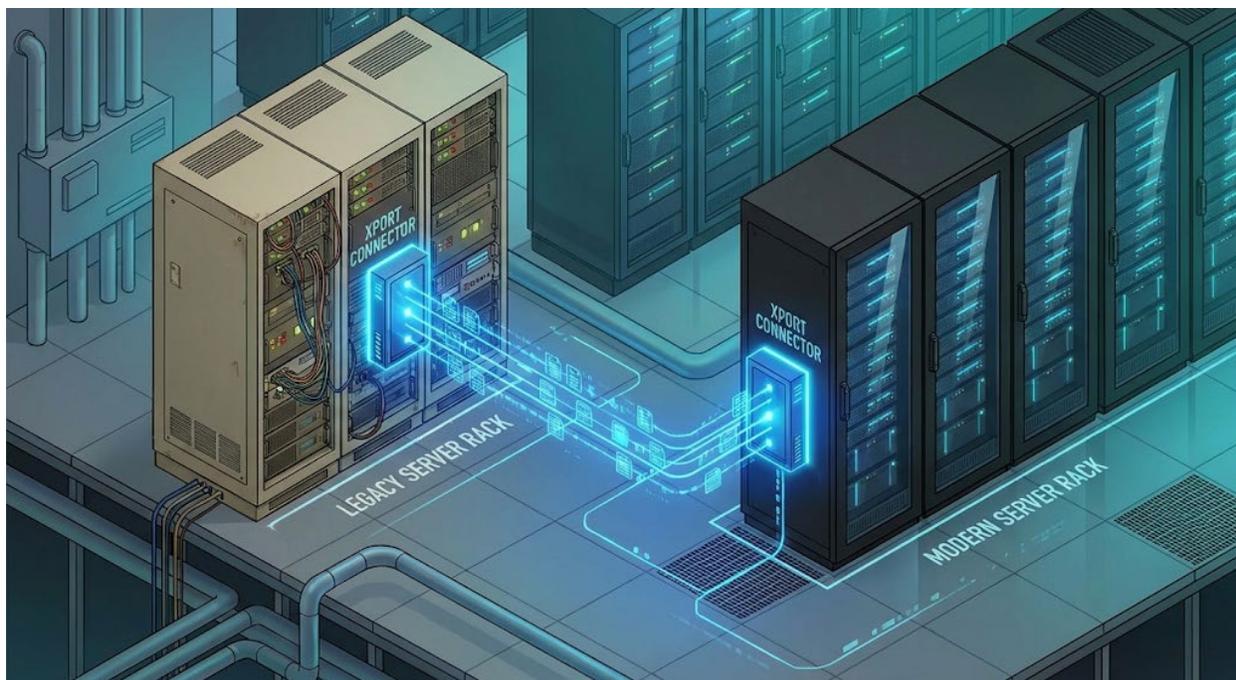
# 3.4 Customs & Inspection Areas



| Product | Nidhi |
|---|---|
| Challenge | A hard drive failed in the inspection bay recorder. The port lost evidence needed for a federal audit. Customs agencies (like CBP) have zero tolerance for data loss. Compliance violations can result in significant fines and operational restrictions. |
| Solution | Nidhi automatically mirrors inspection footage to a secure vault (Cloud or Cold Storage). If on-site hardware fails, Nidhi restores the missing timeline to ensure you pass every audit. The bandwidth scheduler throttles backup speeds during business hours to protect network performance. |

**Nidhi Recovery Workflows:**

1. **Single Volume Failure:** Insert fresh volume, launch Restore Wizard, Nidhi pulls missing footage from vault
2. **Total Hardware Loss:** Install new server, run Recorder Restoration workflow, entire configuration and video history restored
3. **Proactive Monitoring:** Real-time dashboard with Red/Green status, proactive lag alerts, and storage analytics

# 3.5 Infrastructure Tech Refresh



| Product | **XPort** |
|---|---|
| **Challenge** | The port is upgrading the main server farm. Traditional migration takes weeks to migrate cameras, edit XML files, and restore databases. |
| **Solution** | XPort allows IT teams to migrate hundreds of cameras from old servers to new hardware in a fraction of the time – with no downtime. It uses Milestone's API rather than SQL backup/restore, ensuring clean migration without copying hidden scripts or corrupted data. |

**XPort Migration Capabilities:**

- **Server Refresh (1:1):** Move configuration from aging server to new hardware
- **Site Consolidation (N:1):** Merge multiple siloed deployments into a unified system
- **Load Balancing (1: N):** Split an overloaded server into distributed instances
- **On-Prem to Cloud:** Migrate to AWS, Azure, or private cloud infrastructure
- **Sanitization by Design:** Blocks hidden stored procedures, shadow admin accounts, and SQL injections during transfer

# 4. Customer Testimonials

> *"Vega Systems is responsive to our inquiries and provides good Sales and after-sales support to our team. Working with them has been a great pleasure, and we look forward to future collaborations."*
>
> **— Ng Chou Peng, Aeqon, Singapore**

# 5. Technical Summary

## Integration with Milestone XProtect

All Vega Systems products integrate natively with Milestone XProtect as MIP plugins. This means:

- Single pane of glass management within the XProtect Management Client
- No external servers or black boxes to maintain
- Deployment in minutes, not days
- No new applications for operators to learn
- Support for Federated, Clustered, and Independent architecture

# 6. Next Steps

Ready to ensure 24/7 video availability for your port operations? Contact Vega Systems to schedule a technical consultation and demonstration.

## VEGA SYSTEMS INC.

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