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## **IN MANY GRAIN TERMINALS, REDUNDANCY HAS LONG BEEN DEFINED BY DUPLICATION**

**Two unloaders. Identical capacity. A structure that appears robust on paper, but in practice introduces a critical vulnerability.**

When redundancy is built on parallel machines, operational resilience is effectively split in half. The moment one unloader becomes unavailable, capacity is immediately reduced by 50 percent. The consequences are tangible and often costly: extended vessel turnaround times, increased congestion risk, and a direct impact on overall terminal efficiency.

### **WHEN REDUNDANCY CUTS CAPACITY IN HALF**

This raises an important question: is duplicating equipment truly delivering redundancy, or simply distributing risk?

### **IS DUPLICATION REALLY REDUCING RISK?**

A resilient operation should not depend on maintaining all components in perfect condition. True redundancy is defined by the ability to sustain full performance, even in the event of a failure.

### **FROM PERCEIVED SECURITY TO REAL VULNERABILITY**

It is not about how many machines are installed, but how the system performs when conditions are no longer ideal.

### **WHAT DEFINES TRUE OPERATIONAL RESILIENCE?**

Achieving this level of operational continuity requires a different approach to system design, one where capacity is not divided but secured. Where performance is engineered into the process, not assumed through duplication.

### **SECURE CAPACITY - DON'T DIVIDE IT**

For terminal operators facing increasing pressure on efficiency, turnaround times, and reliability, redefining redundancy is no longer optional. It is a strategic decision that directly impacts competitiveness, cost control, and long-term performance.

## **REDUNDANCY AS A STRATEGIC ADVANTAGE**

How redundancy is defined within your operation will ultimately determine how resilient it truly is.