



# EVALUATING INTERNAL CONTROLS IN INVENTORY AND WAREHOUSING OPERATIONS: AN FMEA APPROACH

Risk Identification and Prioritization for Improving Operational Effectiveness  
in Inventory and Warehousing Processes

## 1. BACKGROUND

During the internship in the Gas accounting division, weaknesses were observed in warehouse inventory internal control, such as delayed data updates and slow submission of transaction documents. These issues can cause discrepancies between physical stock and system data, disrupting reconciliation and increasing operational costs. This study applies the Failure Mode and Effect Analysis (FMEA) method to identify potential failures in inventory and warehousing processes, assess their risk levels, and provide improvement recommendations.



## 2. COMPANY PROFILE



PT Putra Kelana Makmur (PKM Group) is a company engaged in energy, engineering solutions, shipping located in Batam, Indonesia. Established in 1986, PKM has grown from a family business into a holding company. PKM Group has legal status in shipping and energy, providing transportation services, cargo and fuel distribution, bunkering, and self-serving with Pertamina in the marketing of energy products.

## 3. INTERNSHIP ACTIVITIES

- Receive, check, and input cash sales documents into Sunfish ERP
- Retrieve invoices, adjust dates, and record credit sales in the system
- Receive, duplicate, and archive purchase documents
- Input LPB numbers into Sunfish ERP
- Create receipts, TTFs, and CBRs according to transaction data
- Scan, save, backup, and archive documents (SIB) for auditing and reporting purposes

## 4. PROCESS OVERVIEW

The gas inventory and warehousing process covers several key activities:



## 5. METHODOLOGY (FMEA)

FMEA uses three main parameters to assess risk:

- Severity (S)**: The level of impact or severity when a failure occurs.
- Occurrence (O)**: The frequency of happening of the failure occurs.
- Detection (D)**: The ability of the system to detect the occurrence.

## 6. FMEA ANALYSIS RESULTS

| Item / Function                                                                                                              | Failure Mode                                                     | Effect                                    | Cause                                                    | Severity (S) | Occurrence (O) | Detection (D) | RPN (SxOxD) | Risk Level | Current Control                                            | Recommended Action                                    |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------|--------------|----------------|---------------|-------------|------------|------------------------------------------------------------|-------------------------------------------------------|
| <br>Receipt of Goods from Purchase          | Quantity of filled cylinders does not match the receipt document | Stock difference in the warehouse         | Calculation errors during shipping process from supplier | 7            | 3              | 3             | 63          | Low        | Physical check of cylinders and matching with SPBE/invoice | Recheck the number of cylinders during goods receipt  |
| <br>Return Receipt                        | Return of leaking cylinders from customers                       | Company loss and customer complaints      | Cylinder leak or damage                                  | 8            | 3              | 4             | 96          | Medium     | Inspection of cylinder condition when goods are returned   | Separate return cylinders and conduct periodic checks |
| <br>Goods Issuance for Sales (SO)         | Delay in goods delivery                                          | Delivery to customers is delayed          | Fleet constraints or delivery schedule                   | 6            | 4              | 3             | 72          | Medium     | Coordination of delivery schedule with driver              | Prepare delivery schedule and ensure fleet readiness  |
| <br>Goods Issuance for Sales Taking Order | Error in recording taking order                                  | Goods sent do not match customer requests | Lack of accuracy in receiving customer orders            | 7            | 4              | 4             | 112         | High       | Order confirmation before delivery                         | Recheck order data before delivery                    |
| <br>Stock Opname                          | Discrepancy between physical stock and system data               | Inventory data becomes inaccurate         | Recording errors of incoming and outgoing goods          | 8            | 5              | 4             | 160         | High       | Periodic physical stock checking                           | Conduct stock checking and recording                  |

Note: S = Severity | O = Occurrence | D = Detection | RPN = S x O x D

## 7. ANALYSIS SUMMARY (RPN RESULTS)

- RPN 160 (Stock Opname)**: Highest risk due to discrepancies between physical stock and system data caused by recording errors.
- RPN 112 (Taking Order)**: Errors in customer order recording may result in incorrect goods delivery.
- RPN 96 (Return Receipt)**: Leaking or damaged cylinders returned by customers may cause company losses.
- RPN 72 (Sales Order)**: Delivery delays caused by fleet constraints or delivery schedules.
- RPN 63 (Receipt from Supplier)**: Quantity mismatch between cylinders and receipt documents.

## 8. RECOMMENDATIONS

- 1**  Improve accuracy in recording and stock data. Strengthen reconciliations, carry out and perform periodic stock checks and reconciliations.
- 2**  Recheck documents and cylinder quantity. Verify cylinder quantity and document conformity before storing goods.
- 3**  Separate return goods. Separate storage areas for serviceable and leaking/damaged cylinders.
- 4**  Strengthen coordination in distribution. Improve coordination among warehouse, driver, and sales to ensure on-time and accurate delivery.
- 5**  Continuous evaluation. Continuously evaluate procedures and controls for sustainable improvement.

## 9. CONCLUSION

The company has implemented procedures and internal control adequately in inventory and warehousing processes. FMEA analysis identified several potential failures, with stock opname being the highest risk (RPN 160). Implementing the recommended improvements can reduce risks, improve process effectiveness, and support the company's operational goals. This analysis provides a basis for prioritizing corrective actions to strengthen internal control in its inventory and warehousing processes.

