Scenario Planning Guidelines for Reallocation of High-DM Loads

Category: Guides | **Model:** SCENARIO-PLN-GUIDE-2025

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1. Introduction

This document provides comprehensive guidelines for the strategic re-routing and reallocation of high dry matter (DM) load batches from lines experiencing over-quality issues to those requiring uplift. Strategic planning in this context ensures optimal line utilization, minimizes waste, and secures cost savings. It incorporates logistical constraints, feasibility criteria, equipment limitations, and detailed simulation models

to evaluate potential benefits.

2. Scope and Objectives

The scope of this guideline includes:

- Assessing current line capacities based on equipment specifications and quality parameters.
- Planning re-routing of high-DM loads considering logistical constraints.
- Evaluating the feasibility of shifting loads through technical and operational assessments.
- Simulating potential cost savings based on regional and line capacity data.
- Implementing risk mitigation strategies and troubleshooting common issues.

The objective is to enable operations teams and planning engineers to execute load reallocation effectively, ensuring compliance with quality specifications and operational safety while optimizing economic outcomes.

3. Related Documentation

This document references the following essential documents:

- **Line Equipment Manuals:** Including specifications such as rated throughput, efficiency thresholds, and maintenance procedures.
- **PSS Quality Specifications:** Detailing SKU quality targets, defect tolerances, and downgrading protocols.
- **Error Codes and Troubleshooting Guides:** Providing detailed root cause analysis and resolution procedures for common equipment errors.
- **Regional Capacity Data:** Capacity profiles based on recent operational metrics, typically last six months.

4. Foundational Data Sources

The following data sources underpin the planning and simulation

processes:

- **Line Equipment Data:** Includes throughput rates, efficiency thresholds, and maintenance schedules.
- **Quality Specification Data:** SKU targets with tolerance bands, defect rates, colour ranges, and downgrading protocols.
- **Operational Logs:** Recent production logs detailing capacity utilization, downtime, and incident reports.

5. Equipment and Quality Specifications

5.1 Equipment Throughput Rates and Efficiency

Summary of typical equipment rated throughput:

Equipment	Rated Throughput (t/h)	Efficiency Threshold	Maintenance Interval
CUT-2000	8.5	85%	200 operating hours
FRY-XL	6.0	80%	150 operating hours
SALT-PLUS	7.8	83%	180 operating hours

5.2 Error Codes and Troubleshooting

Common error codes and their resolutions:

Error Code	Symptom	Root Cause	Resolution Procedure

DOW-PI-45XX	Reduced throughput, equipment shutdown	Sensor malfunction, overload condition, or lubrication failure	1. Verify sensor connections and calibration. 2. Check for overloads on the line; reduce feed rate temporarily. 3. Inspect lubrication and mechanical parts for wear or blockages. 4. Reset the error after corrective actions; log the incident.
DOW-PI-46XX	Temperature alarm, shutdown	Overheating due to cooling system failure or high ambient temperature	1. Inspect cooling systems for leaks or blockages. 2. Ensure ambient temperature is within operational limits. 3. Perform maintenance to restore cooling efficiency. 4. Reset alarm and resume operation with caution.

6. Reallocation Strategies

6.1 Identifying Over-Quality Lines

Analysis involves comparing current product quality metrics against SKU targets. Lines exhibiting consistently high dry matter content, low defect rates, or enhanced quality parameters compared to regional benchmarks are considered over-quality lines.

6.2 Target Lines for Reallocation

Lines with capacity deficits, quality improvement requirements, or scheduled downtime are selected for load uplift. Considerations include:

- Maximum permitted throughput based on equipment specifications.
- Compatibility with high-DM batch profiles.
- Proximity to high-quality raw material sources to reduce logistics costs.

6.3 Re-routing Procedures

The process involves:

1. Data analysis of current throughput and quality status.
2. Simulation of load shifts using capacity models.
3. Scheduling of re-routing in coordination with maintenance and logistics teams.
4. Documentation of planned adjustments and contingency measures.

Example scenario:

```
Current Over-Quality Line: Line A (Rated throughput: 8.5 t/h, actu
Target Line: Line B (Rated throughput: 6.0 t/h)

Re-routing plan:
- Transfer excess load (approx. 0.7-1.0 t/h) from Line A to Line B
- Adjust operating parameters to maintain quality standards.
- Monitor real-time throughputs during initial trials.
```

7. Feasibility Assessment Procedures

7.1 Equipment Compatibility Checks

Ensure target lines can handle increased capacity without exceeding efficiency thresholds or compromising quality. Conduct the following:

- Review equipment maintenance logs for readiness.
- Perform capacity simulations based on current operational constraints.

- Assess physical capacity including feed zones, conveyors, and drying stages.

7.2 Quality Parameter Compatibility

Check SKU specifications for target batches and ensure the high-DM loads can be adjusted or tolerated without falling outside tolerances. For example:

- **Dry Matter % Target:** 21.8% ± 0.3% (acceptable range: 21.5% - 22.1%)
- **Defects % Tolerance:** ≤ 2%
- **Fry Color Range:** 4.0 - 6.0 (on a predefined scale)

7.3 Risk Evaluation

Include considerations for potential quality deviations, equipment overloads, and logistic delays. Implement fallback plans for unforeseen issues.

8. Logistics and Constraints

8.1 Logistical Constraints

Factors affecting load re-routing include:

- Transport capacity and availability
- Proximity of raw material sources and destination lines
- Storage limitations and inventory levels
- Transport time and scheduling conflicts

8.2 Physical and Operational Constraints

Operational limits to consider:

- Line capacity and maximum throughput
- Maintenance schedules and downtime windows
- Quality control checkpoints and inspection protocols

9. Simulation and Cost Analysis

9.1 Simulation Models

Utilize region-specific and line-specific models to assess the impact of load reallocation. Simulation involves:

- Inputting current throughput and quality data
- Applying the re-routing plan parameters
- Monitoring predicted outcomes including throughput, quality compliance, and downtime

9.2 Cost Saving Estimation

Cost savings are computed based on:

Parameter	Impact	Estimated Savings
Reduced Downgrading	Fewer defective batches due to better suited equipment	$50,000/month
Logistics Optimization	Shorter transport routes and improved scheduling	$30,000/month
Line Efficiency	Maximized throughput within safety limits	$20,000/month

The combined savings contribute to operational efficiency and profitability enhancement.
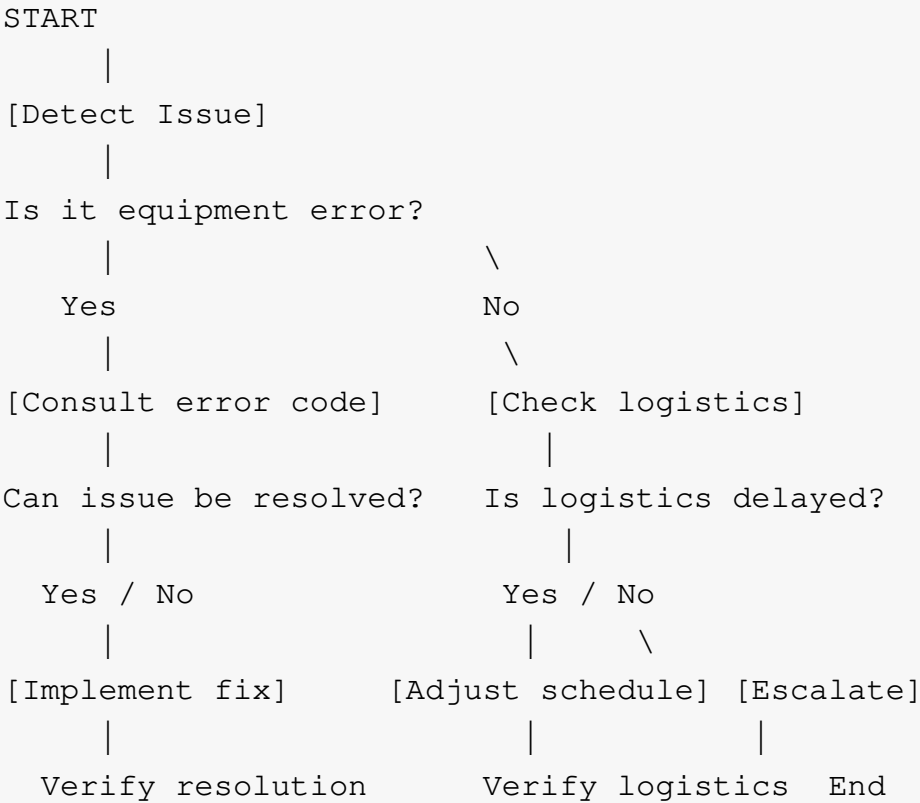
10. Risk Management and Troubleshooting

10.1 Common Risks

- Quality deviations beyond tolerance bands
- Equipment overload leading to unscheduled downtime
- Logistics delays causing stock imbalance
- Miscommunication during re-routing operations

10.2 Troubleshooting Flowchart

Below is a simplified troubleshooting flowchart:

```
START
     |
[Detect Issue]
     |
Is it equipment error?
     |                    \
  Yes                      No
     |                      \
[Consult error code]    [Check logistics]
     |                       |
Can issue be resolved?   Is logistics delayed?
     |                       |
  Yes / No                 Yes / No
     |                       |       \
[Implement fix]      [Adjust schedule] [Escalate]
     |                       |              |
  Verify resolution      Verify logistics  End
```

> **Note:** Regular training and updates are essential for operational resilience.

11. Appendices and Resources

11.1 Sample Equipment Maintenance Log

Date	Equipment	Maintenance Performed	Status
2024-07-15	CUT-2000	Lubrication, belt check	Completed
2024-07-16	FRY-XL	Sensor calibration	Pending

11.2 Useful References