Verktyg och teknik för lönsam logistik

Logistic assurance in new car programmes

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Volvo Car Corporation
Logistic assurance in new car programmes

From reactive packaging and transport “fixing” to proactive logistic assurance in early project phases
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Logistic assurance activities

- 36 months
- 24 months
Logistic assurance activities

- Prestudy
  - Concept studies
  - Industrial structure
  - Definition
- Industrialisation
  - Landed cost
  - Supplier choice
- Start off production
  - Logistic audits

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Concept studies

Taking part in early design discussions ensuring that logistic requirements are considered

Participating in make / buy studies in order to make sure that most cost efficient solutions are chosen from an holistic point of view

Ensure that correct logistic resources are foreseen in the project
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Industrial structure definition

Assuring that we have an industrial structure that supports our Customer Ordered Production concept.

The VCC customer ordered production concept is vital for our overall business result.
Customer Ordered Production

**The LTO supply chain**

- Supplier
- Inbound
- Manufacturing
- Outbound
- Customer

- Supply chain planning
- Inventory
- Parts
- Complete cars

- Forecast
- Customer order
- Delivery to customer

Focus on transportation cost
Supply chain performance is important

"You can have the cars that we have and you can have them now"

**The BTO supply chain**

- Supplier
- Inbound
- Manufacturing
- Outbound
- Customer

- Supply chain planning
- Inventory
- Parts

- Forecast
- Customer order
- Delivery to customer

Focus on overall supply chain cost
Supply chain performance is decisive

"You can have whatever car you want within a short lead time"
Presentation supplier parks VCC
Supplier park VCG

Tenneco, Borgers, CCG, Sekurit, Delphi, JCI, Autoliv, Rieter, Inoplast, Lear, Faurecia, Peguform

TI-group
ECG
MCP
Brose
Plastal
ECA(JCI)

20 km from VCG
3 km from VCG
<table>
<thead>
<tr>
<th>Supplier</th>
<th>Delivery unit</th>
<th>Car family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoliv</td>
<td>Steering wheels, IC, Airbags</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>Brose</td>
<td>Door module</td>
<td>P1</td>
</tr>
<tr>
<td>Borgers</td>
<td>Parcel shelf</td>
<td>P2</td>
</tr>
<tr>
<td>Rieter</td>
<td>Parcel shelf</td>
<td>P1</td>
</tr>
<tr>
<td></td>
<td>Carpets</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>Delphi</td>
<td>Cable harnesses</td>
<td>P2</td>
</tr>
<tr>
<td>Lear</td>
<td>Cable harnesses</td>
<td>P1</td>
</tr>
<tr>
<td>ECA (JCI)</td>
<td>Seats</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>Faurecia</td>
<td>Cockpit, Door panels</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td></td>
<td>Tunnel console</td>
<td>P1</td>
</tr>
<tr>
<td>JCI</td>
<td>Tunnel console</td>
<td>P2</td>
</tr>
<tr>
<td></td>
<td>Head lining</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td></td>
<td>Pillar trims</td>
<td>P1</td>
</tr>
<tr>
<td>Collins &amp; Aikman</td>
<td>Pillar trims</td>
<td>P2</td>
</tr>
<tr>
<td>CCG (Benteler)</td>
<td>Rear axle, front center, wheel corner</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>ECG</td>
<td>Power pack</td>
<td>P1 &amp; P2</td>
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<tr>
<td>Sekurit</td>
<td>Glass</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>Kautex</td>
<td>Fuel tanks</td>
<td>P1</td>
</tr>
<tr>
<td>TI-group</td>
<td>Fuel tanks</td>
<td>P2</td>
</tr>
<tr>
<td>Tenneco</td>
<td>Exhaust systems</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>MCP</td>
<td>Wheels</td>
<td>P1 &amp; P2</td>
</tr>
<tr>
<td>Peguform</td>
<td>Bumpers</td>
<td>P1</td>
</tr>
<tr>
<td>Plastal</td>
<td>Bumpers</td>
<td>P2</td>
</tr>
</tbody>
</table>
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LANDED COST

Transport
Internal handling
Packaging
Administration
Capital
Surfaces

++

LOGISTIC COST

++

PART PRICE

++

LANDED COST
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**MMOG** = Global Management Operations Guideline / Logistics evaluations

Audit that is being performed on all new potential suppliers or suppliers which constantly cause problems to VCC.

Self assessment with verification follow up visit at site if needed.
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Supplier Choice

The most important thing in a new car project is to select the correct supplier and make sure that we provide the correct prerequisites.
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Logistic assurance activities

- Prestudy
  - 36 months
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  - Industrial structure
  - Definition
  - Logistics Audits

- Industrialisation
  - 24 months
  - APQP
  - EDI implementation
  - Transport flow set up
  - Packaging development

- Start off production
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**Advanced Quality Program Planning**

Since 2003 the VCC APQP also contains 47 questions that are mandatory for all suppliers in a car project to answer.

Based on these answers and the results from the MMOG audit we can prioritise which suppliers needs extra focus during the industrialisation phase.
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Logistic Assurance within APQP

Volvo Car Corporation

Sub-supplier

Procurement

Production at supplier

Distribution

Material ordering

Inbound transport

Logistic provider

Sub contractors

Supplier process

L-FMEA

Volvo Car Corporation

MP&L
82400 Jöhan Rådmark, jradmark
Date: 2004-11-30
FLEXIBILITY CHIMNEY MODEL

Usage  Weekly and Monthly flexibility

-100% % of total production  100%

0 - 1 %: 0-60 pcs 0-150 pcs
1 - 10 %: -100,+150 % 50 %
11 - 20 %: 75 % 40 %
21 - 30 %: 50 % 40 %
31 - 50 %: 40 % 30 %
51 - 80 %: 20 % 20 %
81 - 100 %: 10 % 10 %

0 %

+150 % Flexibility
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Volvo Cars EDI Demands

• 100% usage of EDI without a manual interference, the business must include the following functionality's according to Volvo’s profile of the Odette subset of EDIFACT.
• DELINS, Delivery schedules message.
• Calloff, based on DELINS
• SYNCRO only sequence suppliers.
• AVIEXP, Advanced shipping note.
• OTL, Odette transport label.
• INVOIC, Self-billing message. Based on D96A
• ENGDAT, Engineering model exchange with a two way capacity.
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Transport flow set up

Optimise transport cost and frequency. Minimise environmental impact.

Focused on
• Full loads
• Optimal milk runs
• Delivery condition-Free Carrier (FCA)
• Co-ordinated return transport
• Choice of transport mean
• Use lead logistic provider
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FULL LOADS

- 100% trailer fill rate.
- Reduction of administration.
- No extra handling of pallets at transporter’s terminal
- Potential transport cost reduction 20-50%.

Preconditions for suppliers on full load:
- AVIEXP or DESADV = 100%
- Daily Call-Offs
- Daily/Dynamic pick-up possibilities at supplier
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Packaging design

Standard packaging or typebound packaging?

If typebound inhouse or outsourced packaging design?

Inhouse is always chosen when the packaging has a high impact on the assembly process.
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Virtual Verification

Adaptation to virtual product development of product and process

Ergonomics

Quality assurance during Transport
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Logistic assurance activities

Prestudy
- 36 months

Concept studies
Landed Cost
Industrial structure definition

Industrialisation
- 24 months

Logistic Audits
Transport flow set up
Packaging development
Material Handling

Start off production

Hopefully as little as possible!
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My message to you today:

• Focus on early involvement in new projects

• Don't wait to get invited, invite yourself if needed

• Ensure that you have enough resources and rigid processes in early project stages
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My message to you today:

REMEMBER: what you forget to do in early project phases you will have to do later at a higher cost with a higher time pressure and most likely with a worse result.