

RENAULT TRUCKS CASE STUDY

THE PROBLEM

- ▶ Increase the added value
- ▶ Standardize harness production engineering, whatever the initial design studies
- ▶ Work just-in-time
- ▶ Manage the life cycle from end to end while considering variants, options, upgrades, etc.

THE SOLUTION

- ▶ Set up a single tool for the design of harness production processes
- ▶ Develop automated platforms for recovering design data.
- ▶ Use VOLVO IT's expertise and services in solution integration

BENEFITS

- ▶ End-to-end control of the problem and the production file
- ▶ Zero defects
- ▶ Manufacturing data generation times 70 to 80% shorter
- ▶ Product chain made reliable
- ▶ Management of life cycles down to wire level

WHY CHOOSE THIS SOLUTION

- ▶ Complete recovery of existing data and its intelligence
- ▶ ELSYS' industry-specific expertise in electrical engineering
- ▶ ELSYS' and VOLVO IT's experience in multi-PDM contexts
- ▶ DSI interface effectiveness and performance
- ▶ Availability of SVG outputs to ensure ready access to data



FROM THE INDUSTRIAL CONTEXT TO THE HARNESS PROBLEM



Within Renault Trucks (VOLVO Group), the Harness Production Center at Blainville-sur-Orne (C2F) specializes in outlining and organizing the industrial methods used to produce the wiring harnesses fitted on the vehicles manufactured by the company. This assignment is all but simple as the engineering department has to deal with numerous limitations and a wide range of situations. These issues result from several factors, both technological and economic:

- priority to maintaining and developing added value to tackle the fiercer competition from low-cost production centers,
- the growing complexity of on-board electrical and electronic equipment,
- the wide range of variants, options and engineering changes to satisfy demand and meet specific needs,
- the need to handle projects on a just-in-time basis to allow jobs to be customized while controlling production costs,
- the need for transparent handling of the data collected from the Group's various design centers (industrial vehicles, military vehicles, spare parts, etc.)

This results in an upwards-spiraling diversity and complexity of the harnesses to be dealt with.

Both Renault Trucks' incorporation of the VOLVO Group's tools applied to electrical design studies (SABER software) and the roll-out of new-generation vehicles, as part of the Premium New Generation project, fostered a complete overhaul of the engineering and software tools used at C2F to design wiring harnesses.

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The objective was to define and set up a tool capable of dealing from end to end with the demand for harness production chain design studies, applied to existing and future industrial vehicles, military vehicles and after-sales needs.

Industry-specific working groups (made up of specialists in electrical design studies, experts in production engineering, and VOLVO IT consultants) tackled this issue with a view to defining, testing and setting up a single tool enabling C2F to achieve its objectives in terms of flexibility, quality and reliability.

A SOLUTION ENSURING CONSISTENCY AND PERFORMANCE

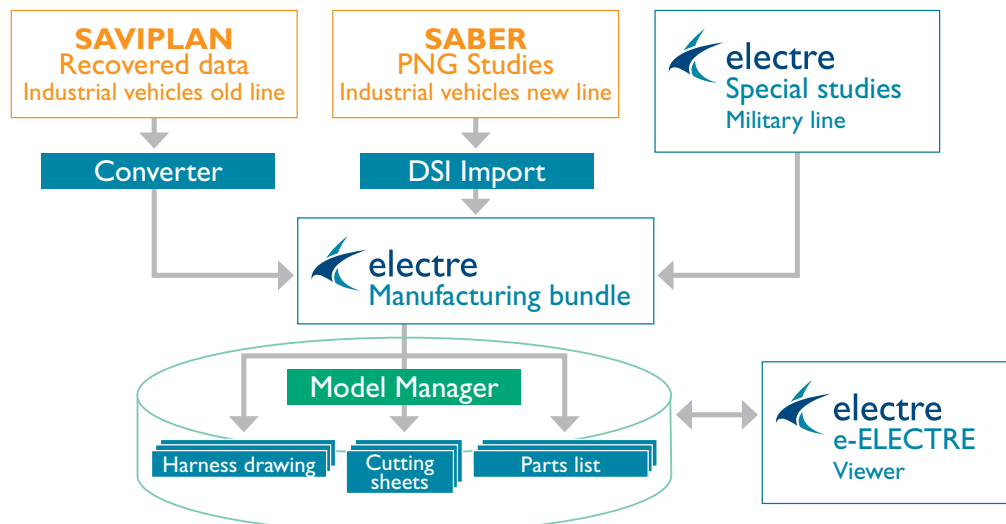
The solution chosen is based on ELECTRE as central information processing and production file generation tool, combined upstream with specific platforms and downstream with CoCreate Model Manager for life-cycle management.

Three sources of information provide input to the engineering studies:

- DSI Import between SABER and ELECTRE to deal with the files relating to the new lines of vehicles (PNG studies),
- The SAVIPLAN translator to recover and process existing data (old vehicle line),
- ELECTRE to handle military studies and studies specific to production, and to meet after-sales needs.

This solution has many advantages and enables C2F to make full use of what already existed (SAVIPLAN) while complying with the choices made by the VOLVO Group (SABER): the Group's engineering departments perform their electrical design studies using their own tools and deliver to C2F a set of files (.tiff and .txt) representing the comprehensive «all options» plan. This data is processed automatically (via the DSI interface or the SAVIPLAN platform) and automatically generate a generic diagram in ELECTRE. C2F's engineering department then uses ELECTRE in interactive mode to extract and specify the physical harness to be made (the specification operation) and create the files necessary for production (dimensions, texts, figurines, etc.). In the end, ELECTRE generates the whole production file - the harness drawing, cutting sheets, parts list, etc. that make it possible to release the production orders. This file is saved and managed in Model Manager, in order to ensure complete management of the electrical life cycle, from the overall drawing down to wire level, each item being perfectly characterized and identified by its own reference.

VOLVO IT teams were in charge of specifying the electrical processes specific to Renault Trucks, drafting the specification of the application, validating the solution generated by ELSYS (functional test), and rolling it out on the Blainville C2F site. The development work on the complete ELECTRE + Interfaces + Model Manager solution and its integration were conducted by the ELSYS teams. VOLVO IT acts as a project leader, provides user support and specifies upgrade requests.



A CALCULATED AND EFFECTIVE CHOICE

In practical terms, the processing chain is matched to the source of the design studies, but corresponds, for C2F, to a single processing stream, which was actually one of the objectives: DSI import between SABER and ELECTRE for the PNG studies, automatic converter between SAVIPLAN and ELECTRE to recover the studies of the old vehicle line, direct use of ELECTRE for military studies and production engineering.

The choice of an automated solution for data recovery was required considering the volume and the wide range of files to be processed - from 5 to 10 a day, with a few dozen to several hundred references per drawing - but would imply limitations in data translation or recovery. Fortunately, ELSYS' experience and industry-specific expertise in electrical diagrams made it possible to meet the target, and can now ensure a guaranteed performance.

Lastly, using Model Manager to manage the data makes it possible to store all project information in a single system, and to manage changes and life cycles down to wire level: assembly drawings of the harnesses, complete wires databases, drawings of each reference, cutting sheets, parts lists, multiple production files, etc.

But the application does not stop there: ELSYS provides a specific application, e-Electre, which allows interactive display (in SVG format) of all electrical drawings and information stored in the database. From workshops, after-sales departments, assembly centers or any standard workstation, it is possible to look up, view or compare a manufacturing file, a drawing, a harness, a wire, a file, etc., by simply entering a reference.

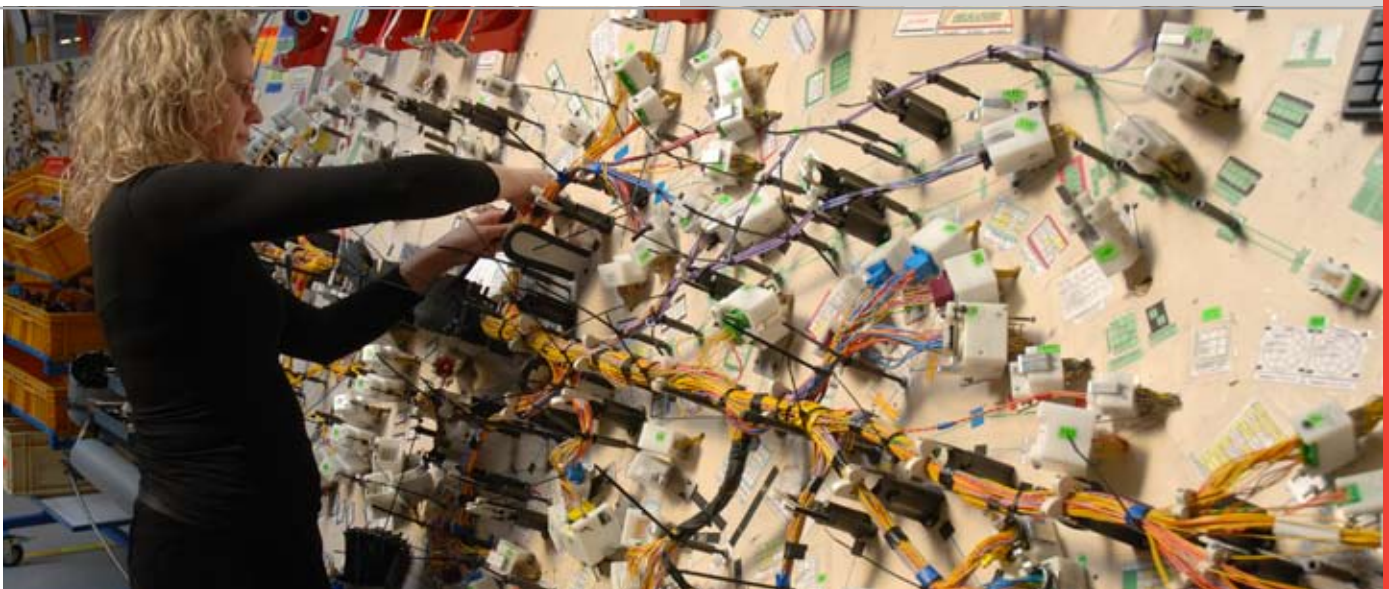


« Never a worry about a length or a parts list, elimination of errors in drawing references and life cycles: we have great confidence in the system and the whole site is benefitting

We now have full control of our production process as a whole: the product folder is of course 100% in compliance with the design specifications, but also includes everything needed for production: harness drawing, assembly operations, logistic preparation, etc.

Quality has become excellent, as concerns both the generation of the production tables (form boards) and the quality chain as a whole. C2F can now boast that it has reached next to zero defects. »

- LUDOVIC DARDENNES
ELECTRICAL CAD PROJECT MANAGER,
RENAULT TRUCKS,
Harness Production Center, Blainville-sur-Orne



FROM NEEDS SATISFACTION TO CUSTOMER SATISFACTION

Started in 2002, this project quickly yielded industrial results, as soon as the interfaces had been implemented, in other words less than 1 year later. Approximately every 2 years, new versions have made it possible to add functions, in particular in the management of manufacturing data.

The C2F engineering managers and technicians, supervised by VOLVO IT and assisted by ELSYS' support teams, quickly got their bearings and opted for the new solution. This solution has many advantages, which are, according to Ludovic Dardennes, Reliability, Conformity, Security and Responsiveness:

- Elimination of wrong references at all levels and exact calculation of wire lengths,
- Complete conformity of the resulting harnesses with the design specifications,
- Quality close to zero defects,
- Cutting processing times by a factor of 4 on average,
- Recovery without alteration of thousands of harness drawings by SAVIPLAN,
- Work conducted as part of a trusted partnership with VOLVO IT's design and IT departments.

The next step? Linking the ELECTRE Solution and the plant's production management system (VTPX or its successor) to make the product cycle even shorter and work on a just-in-time basis without failure of the digital chain. There too VOLVO IT's expertise in analysis and project management and ELSYS' responsiveness in adjusting its products will be harnessed. The combined know-how of C2F, VOLVO IT and ELSYS teams and their successful experience of working together, will certainly be further enhanced on completion of this new project.

« The interfaces provided by ELSYS are of outstanding quality and boast excellent performance. Thanks to the SAVIPLAN translator, we have recovered and processed more than 20,000 documents in 2 years, and the DSI interface is used daily to manage exchanges with the engineering departments without loss

The level of reliability achieved means that the design studies themselves benefit from this chain, and can focus on the mass production studies, making full use of the flexibility, simplicity and security made possible by the processing conducted by the engineering department »



- CHRISTOPHE BRUNETTON
MAINTENANCE MANAGER,
ELECTRICAL DOMAIN,
VOLVO IT

www.volvoit.com



www.e-elsys.com

ELSYS
Rue Vilain XIII 53-55
B-1000 Bruxelles
T +32 2 639 13 60
F +32 2 639 13 61
info@elsys.be

ELSYS
11 rue des Draperies
F-69450 Saint Cyr au Mont d'Or
T +33 4 72 19 88 73
F +33 4 72 19 88 76
info@elsys.fr