



Esterel Technologies

**Eric Bantegnie, President & CEO, Esterel
Technologies**



Esterel Technologies

Corporate Profile

- ➔ **Software Editor, founded in 1999**
- ➔ **100 employees, present in 6 countries**
 - ◆ France, USA, Canada, UK, Germany & China
- ➔ **Specialized in Development Tools for:**
 - ➔ **Critical Embedded Software Applications (SCADE)**
 - ◆ Aerospace
 - ◆ Automotive
 - ◆ Energy & Transportation
 - ➔ **Critical electronic Components (Esterel Studio)**
 - ◆ Semi-Conductors & Electronics



Critical Embedded Software Applications

- Aerospace & Defense

- ◆ Flight control systems
- ◆ Autopilots
- ◆ Engine control systems
- ◆ Braking systems
- ◆ Cockpit display and alarm management
- ◆ Fuel management
- ◆ Power management
- ◆ On-board communications
- ◆ Reconfiguration management



- Automotive

- ◆ Engine regulation
- ◆ Airbags
- ◆ Display management
- ◆ Electrical power management
- ◆ Seat Memory & Body subsystems
- ◆ ABS
- ◆ Airbags
- ◆ Adaptive Cruise Control
- ◆ Entertainment systems



- Energy

- ◆ Nuclear systems control & command

SCADE Suite and SCADE Drive

The Problem:

- ♦ *Human lives are at risk*
- ♦ *Embedded software has to be certified wrt very strict rules*
- ♦ *Certified code cost = 4 times normal code*
- ♦ *Verification costs $\geq$ 50% of total development costs*



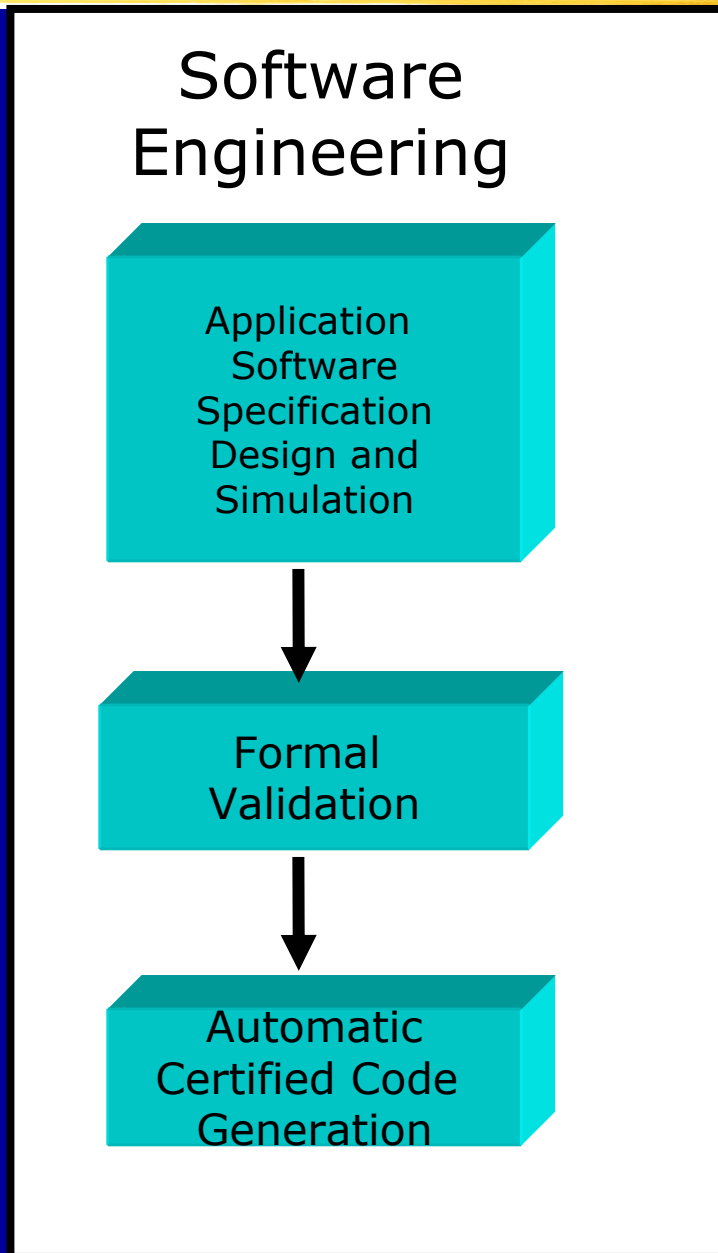
The SCADE Solution:

Safety-Critical Application Development Environment

- ♦ *Covers the full development cycle of critical embedded software development from specifications to automatic generation of certified code*
- ♦ *The only automatic code generation tool qualified to:*
 - *The strictest level of the Civilian Avionics Guideline DO-178B, Level A*
 - *The MISRA automotive guideline*
 - *The 1E Nuclear industry safety standard*



Embedded Software Design Flow



Example: AIRBUS Success Story



- **SCADE Suite™** used for the flight control system of the A340-600, DO 178B level A equipment
- **Results:**
 - ◆ 70% of the code generated with SCADE Suite™
 - ◆ **No coding error has ever been found in the code generated by SCADE Suite™**
 - **« Correct by Construction » Code Generation**
 - ◆ Specifications changes and modified code quickly available reducing time-to-market
 - ◆ Reduction of 50% in development costs, reduction by a factor of 3 to 4 of the modification cycle, compared to manual coding
- **Now standardized on the SCADE Suite™ product (A340-500/600, A380 and A400M)**



SCADE Suite & SCADE Drive

Current customer base

Civilian Avionics

- Aircraft Braking Systems
- Airbus
- Dassault Aviation
- Diehl Avionik Systeme
- Elbit Systems
- Eurocopter
- Honeywell
- Liebherr-Aerospace
- Messier-Bugatti
- Nanjing Aerospace Inst.
- Pratt & Whitney
- Rockwell Collins
- Snecma
- Thales Avionics



Defense & Space

- Dassault Aviation
- EADS Military
- EADS LV
- Elbit Systems
- ESA
- Eurocopter
- Flight Dynamics
- Hispano-Suiza
- NASA
- Rockwell Collins
- Sagem
- Thales Airborne Systems

Energy/Power/ Transportation

- CSEE Transport
- Framatome
- Schneider Electric
- DS&S

Automotive

- AWA
- Audi
- FTE
- General Motors
- Johnson Controls
- PSA Peugeot Citroen
- Visteon



Customer Benefits

**An open source quality
algorithm design environment**

+

**A Commercial Industry Proven
Safety & Mission-Critical
Software**

Certified development tool

=

Best of both worlds !



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