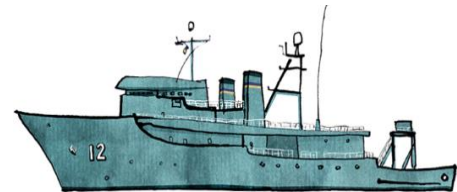
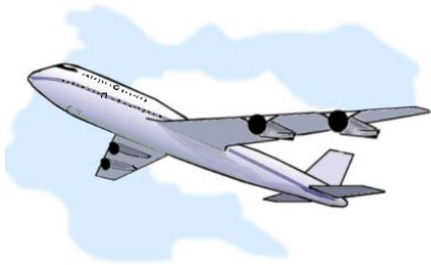




# EDUARDO CALIXTO

CONSULTING





## About Us

who we are? \_\_\_\_\_

# ECC is an Engineering Consultant company

established in Europe since 2015

which provide Reliability, Maintenance and Safety engineering consultant service as well as Asset management solution for Oil and Gas, Railway, Military, Aerospace and Defense industries around the globe based on following programs:

**Asset Integrity**  
**Reliability & Maintenance**  
**Integrated Logistic Support**

what we do? \_\_\_\_\_

### Asset Management performance optimization based on:

- LDA (Lifetime Data Analysis);
- RAM (Reliability, Availability and Maintainability Analysis);
- FRACAS (Failure Report and Correction Action System);
- WA (Warranty Analysis);
- FMEA (Failure Mode and Effect Analysis);
- RCM (Reliability Centred Maintenance);
- RBI (Risk Based Inspection);
- APO (Asset Performance Optimization);
- ORT (Optimum Replace Time);
- Asset management based on SaaS solution (Integrity PRO).

### Asset Integrity Management based on:

- Risk Management;
- Risk analysis (HAZOP, PHA, HAZID, SIL, LOPA, FTA, ETA, BOW TIE, Consequence and Effect Analysis);
- Human Reliability analysis (THERP, OAT, HEART, SHERPA, STAH-R, SPAR-H, Slim-Maud, BBN);
- Reliability engineering (FMEA, RBI, RAM);
- Asset Integrity management based on SaaS solution (Integrity PRO).

### Integrated Logistic Support based on:

- Spare optimization based on modelling;
- Inspection and preventive maintenance optimization based on modeling;
- Life Cycle cost optimization;
- Asset performance optimization.

### Safety Engineering based on:

- Functional Safety Analysis;
- Hazard Log Analysis;
- SIL analysis (assignment, verification and validation);
- Occupational risk assessment;
- Risk Management (hazard identification, risk analysis, risk evaluation, risk mitigation, risk communication, risk monitoring);
- Safety and Occupational Health Management;
- Safety System Audit based on ISO 18001 standard series;

## Training Online and Presential:

RAM Program implementation, Lifetime Data analysis, RAM analysis, FMEA/RCM Analysis, Integrated Logistic Support Analysis, Asset Management, Asset Integrity Management, Risk Management and analysis, Human Reliability Analysis.



## Success cases



### Railways Industry

#### RAMS process implementation for railways: Locomotive Auxiliary Power Unit case

**Description:** The RAMS program for the Auxiliary Power Unit (APU) system for India Railway locomotives was provided based on different reliability, maintenance and safety engineering methods together with Molinari Austria Design Engineers.

**Scope:** The APU system equipment under the analysis scope were diesel engine, engine cooling, gearbox, compressor, compressor cooling, magnetic clutch, coupling, electrical cabinet, tank fuel, transfer pump, generator, power supply. The RAMS program encompassed Design FMEA, Process FMEA, FMEA, RCM, RAM analysis, Human Reliability Analysis and Preliminary Hazard Analysis.

**Results:** The RAMS assessment provides the qualitative and quantitative recommendations to enable the APU system achieves the desired performance. Therefore, the quantitative RAM performance indexes prediction such as Operational availability, Reliability and Expected Number of Failure was carried out and recommendation from the RAM analysis were implemented. In addition, the qualitative recommendation defined in the DFMEA, PFMEA, HRA and PHA were also implemented in order to avoid early life failures and incidents.

#### RAM analysis for railways: Telecommunication Rolling Stock and Service depot system

**Description:** The RAM analysis was carried for Telecom System of Rolling Stock and service depot in the UK (London) to define the telecommunication performance index and identify the critical equipment that would affect the depot maintenance and operation activities.

**Scope:** The Telecom system equipment under analysis scope were Depot Radio (Radios handset, Antennas, Radio, Base Radio, GSM-R (GSM-R radio and Dispatcher), Clock system, CCTV, Fiber patch panel (Panel, VLAN, LAN, PC, control).

**Results:** The preliminary reliability index for the telecommunication system was defined for the concept phase based on the telecommunication system performance derating as well as the critical equipment based on RAM analysis result.

#### RAMS program Implementation for Chinese Railway Industry company

**Description:** RAMS Program Improvement

**Scope:** Wheelset (Axle, Bearing Box and Wheels)

**Results:** Together with our Partner Qinda technology in China, we started our first project in China in 2019. The Project objective is to support the RAMS program implementation. The first step was to deliver 40-hour training, including: RAMS program, FMEA, Life Time Data Analysis and RAM analysis. The next step is to review the current RAMS procedures and deliver new procedures.

#### ILS Program implementation for Railway Industry in Switzerland 2018/2019

**Description:** ILS Program Implementation for a train

**Scope:** Train system such as Bogie, Brake, Door, ERTS, Fire System, Information System.

**Results:** This is a Hünнемeyer Consulting project that started in July 2018 and will finish the first phase in March 2019. The ECC objective was to support the best class Engineering Consultant (Hünнемeyer Consulting) based in Germany to implement specific reliability engineering methods to support the ILS program implementation for a world class Railway Company based in Switzerland. During the project the following methods were implemented: FMEA; Reliability and Maintainability data prediction; RAM analysis; Maintainability Analysis;

## Success cases



### Aerospace and Defense industry

#### RAMS Assessment for RADAR System

**Description:** Reliability and Functional Safety Analysis Implementation

**Scope:** RADAR system, Transmitter System and Waveguide System

**Results:** Working with Philotech client, the objective of the project was implemented RAMS analysis for a RADAR system such the Functional Hazard Analysis, RAM analysis, FMEA and FMDA were based on the aerospace regulation and standards.

#### RAMS Program Evaluation for Flight Simulator System

**Description:** Reliability and Safety Engineer Evaluation (ISO 12100, EN 1384 and IEC 62061)

**Scope:** Flight Simulator System

**Results:** The objective of the project was to evaluate the level of RAMS program implementation maturity by accessing the application of different RAMS methods such as RBD, FMEA, FTA, MTA, Functional Hazard Analysis (EN 1384 and IEC 62061) and Preliminary Hazard Analysis (ISO 12100.) implemented for a Flight Simulator System. The next phase will encompass the RAMS program implementation.



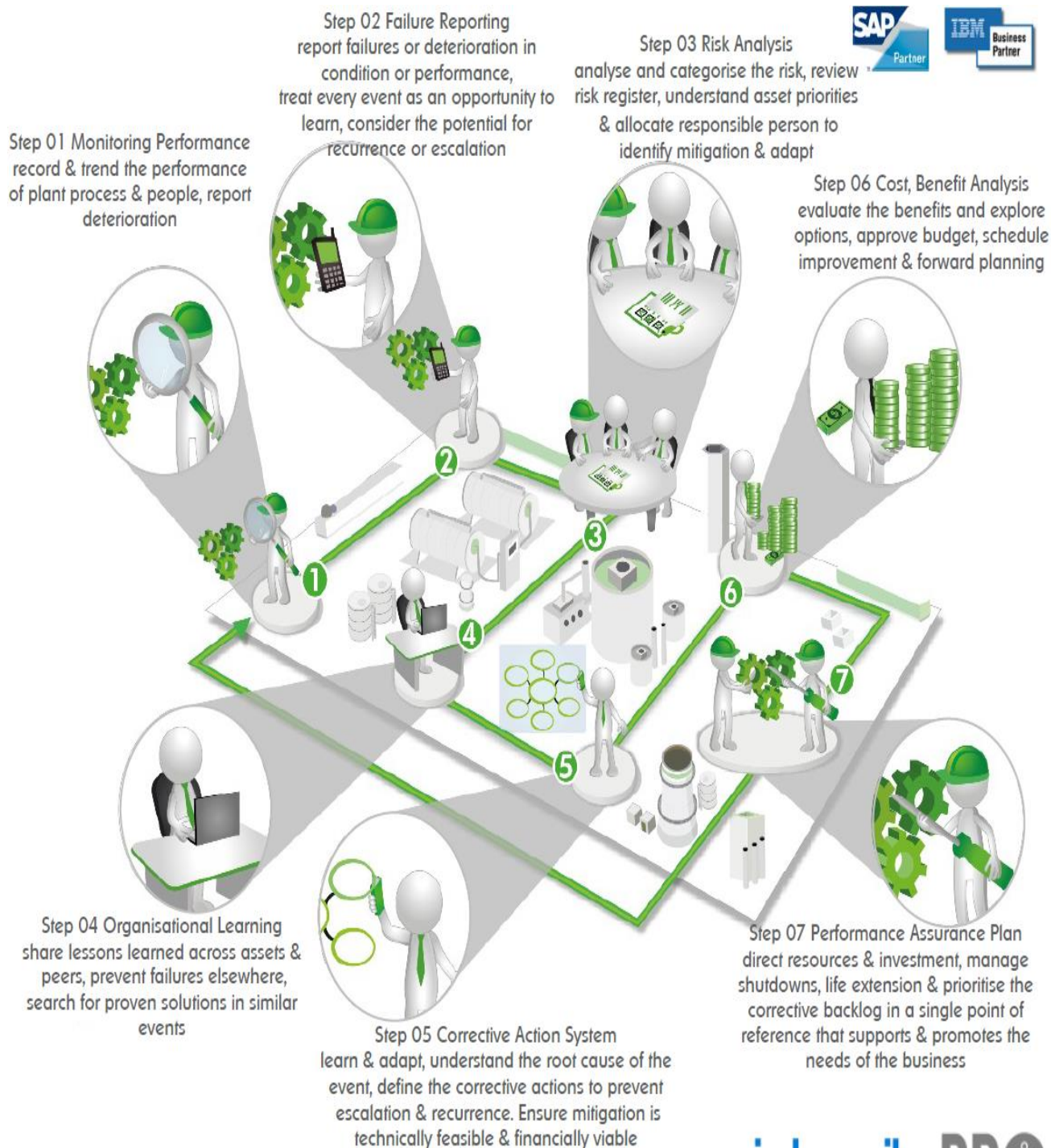
### Oil & Gas industry

**Reliability & Safety Engineering:** More than 10 years' experience worked by major Oil and Gas industry companies as employee and consultant in South America, Middle East, Europe and Asia.

**Asset Management & Asset Integrity:** Currently working with the Partner Enkelt to develop the Integrity Pro SaaS solution concerning Reliability 4.0 and Prognostic Health Management for client in Europe, Africa and Middle East.



# Product 1: Asset Management based on ISO 55000: Integrity PRO SaaS

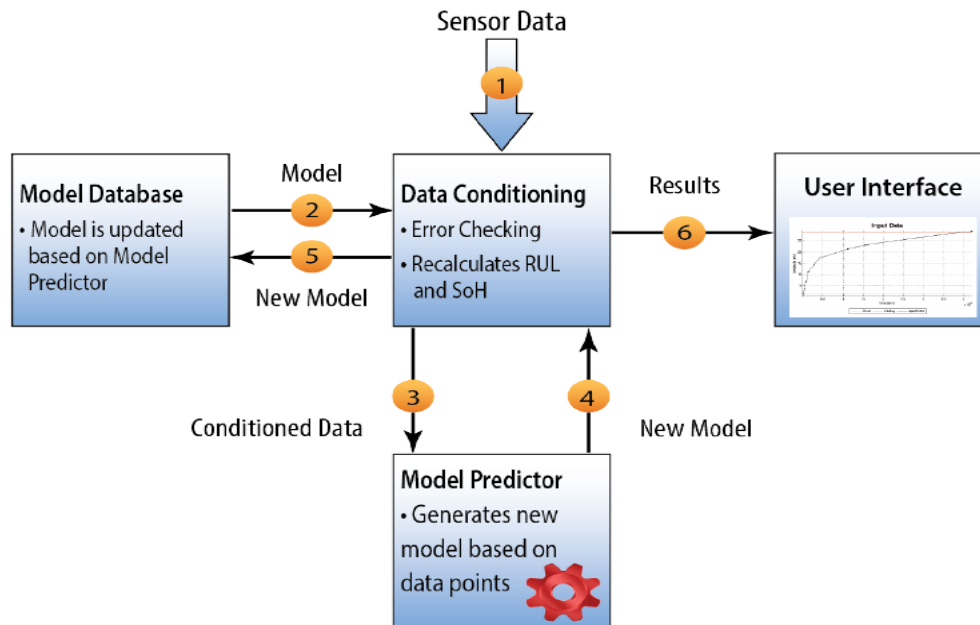




## Product 2: Aladdin Software for infrastructure Maintenance Management



### Product 3: ARULE Software for Prognostic Health Management



*Remaining useful life representation of a system with ARULE API deployed in a Sentinel IT™ application*

## Contact us



### EDUARDO CALIXTO CONSULTANT

Eduardo Calixto Consultant (ECC)  
Ravensburgerstraße 12, 89079, Ulm, Germany  
Email: [ec@eduardocalixto.com](mailto:ec@eduardocalixto.com)  
Website: <http://www.eduardocalixto.com>  
Phone GER: 0049 17651 656067

## ECC and Partners

