



REMOTE TESTING

New approach for Space

Manuel Domínguez

March, 13th 2019 – ESCCON 2019

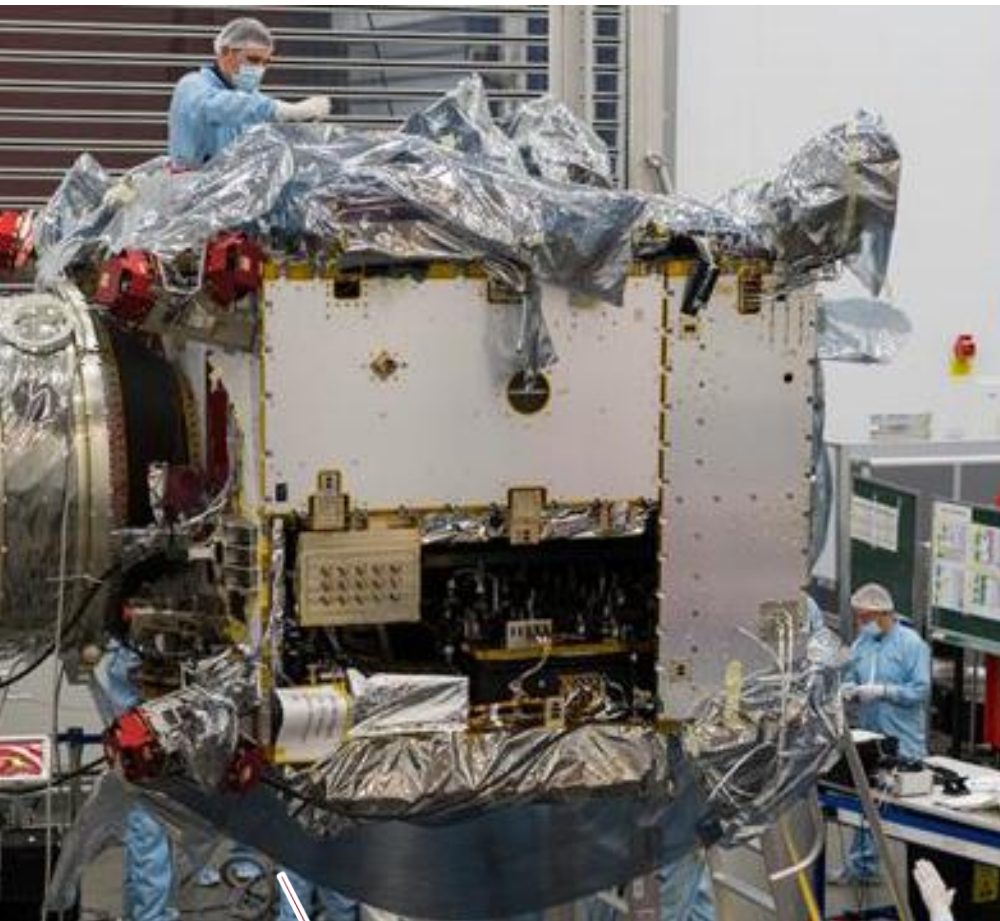
TÜV NORD GROUP

ALTER
TECHNOLOGYGROUP

The Connected Factory in Action



CAN YOU SPOT THE 10 DIFFERENCES IN THIS PICTURE?



© AIRBUS DS/MAX ALEXANDER



© AIRBUS DS/ DR



solar orbiter

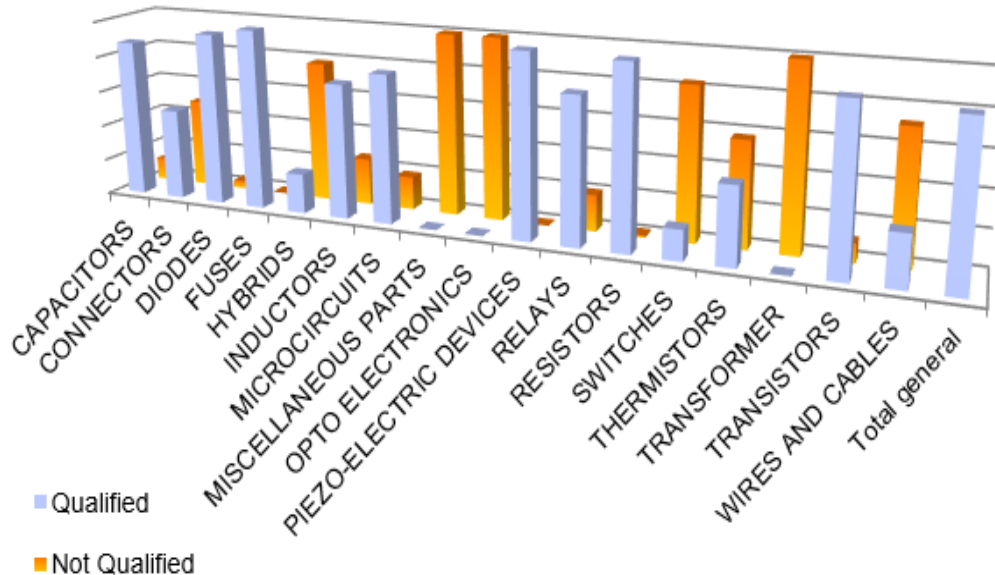
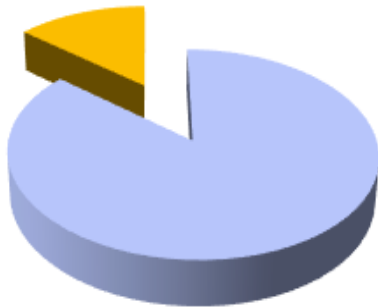
OneWeb

SOLAR ORBITER

HOW MANY LOTS WERE NEEDED?

- 3769 line items procured for FM

Qualified 86.26%
Not Qualified 13.74%

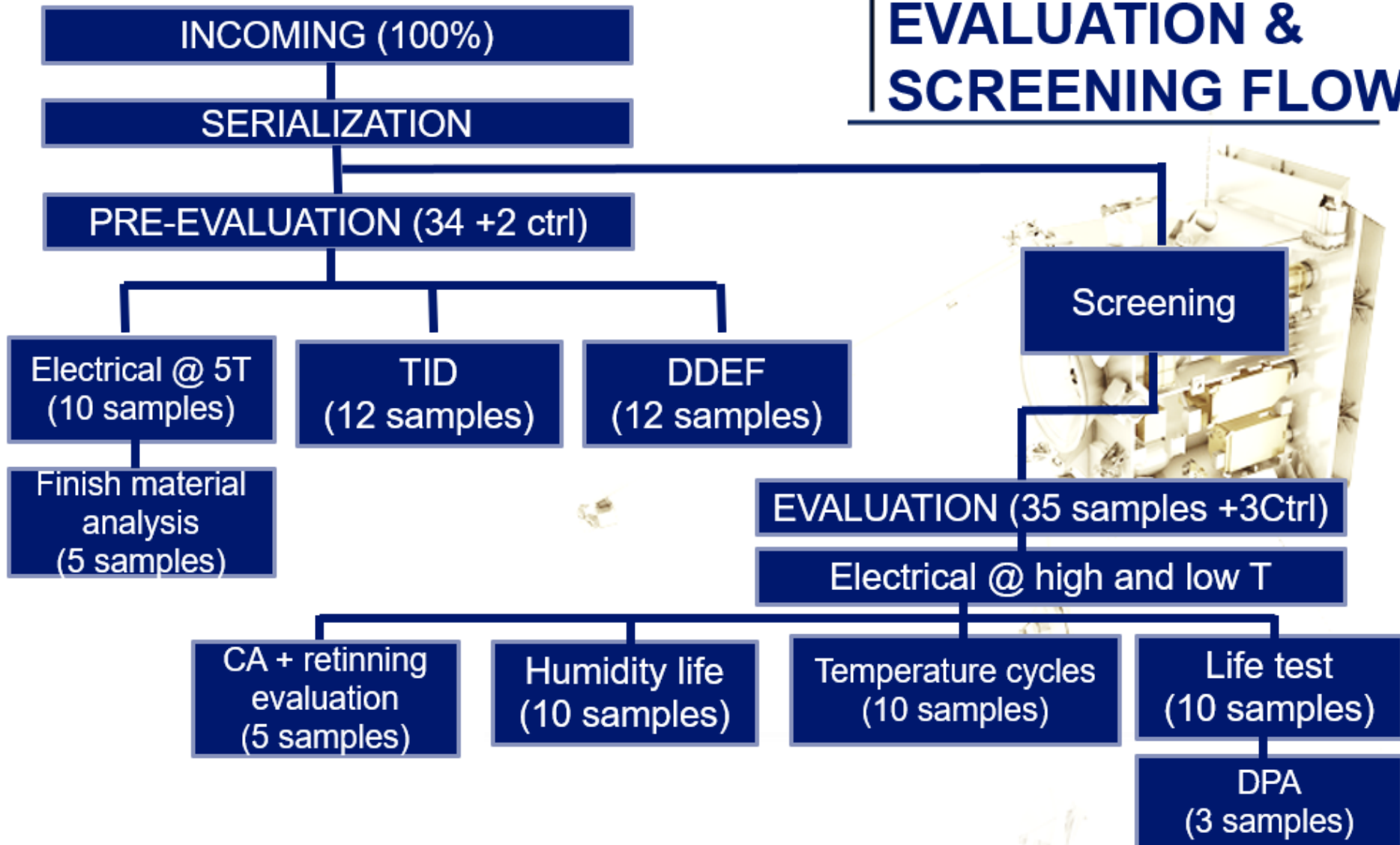


	ESCC	MIL	NOT QUALIFIED
CAPACITORS	391	197	83
CONNECTORS	123	2	123
DIODES	76	131	9
FUSES	1		
HYBRIDS		16	57
INDUCTORS	50	2	18
MICROCIRCUITS	39	358	88
MISCELLANEOUS PARTS			2
OPTO ELECTRONICS			29
PIEZO-ELECTRIC DEVICES	3		
RELAYS	4		1
RESISTORS	859	796	21
SWITCHES		1	5
THERMISTORS	12	2	19
TRANSFORMER			14
TRANSISTORS	107	70	21
WIRES AND CABLES	11		28
Total	1676	1575	518

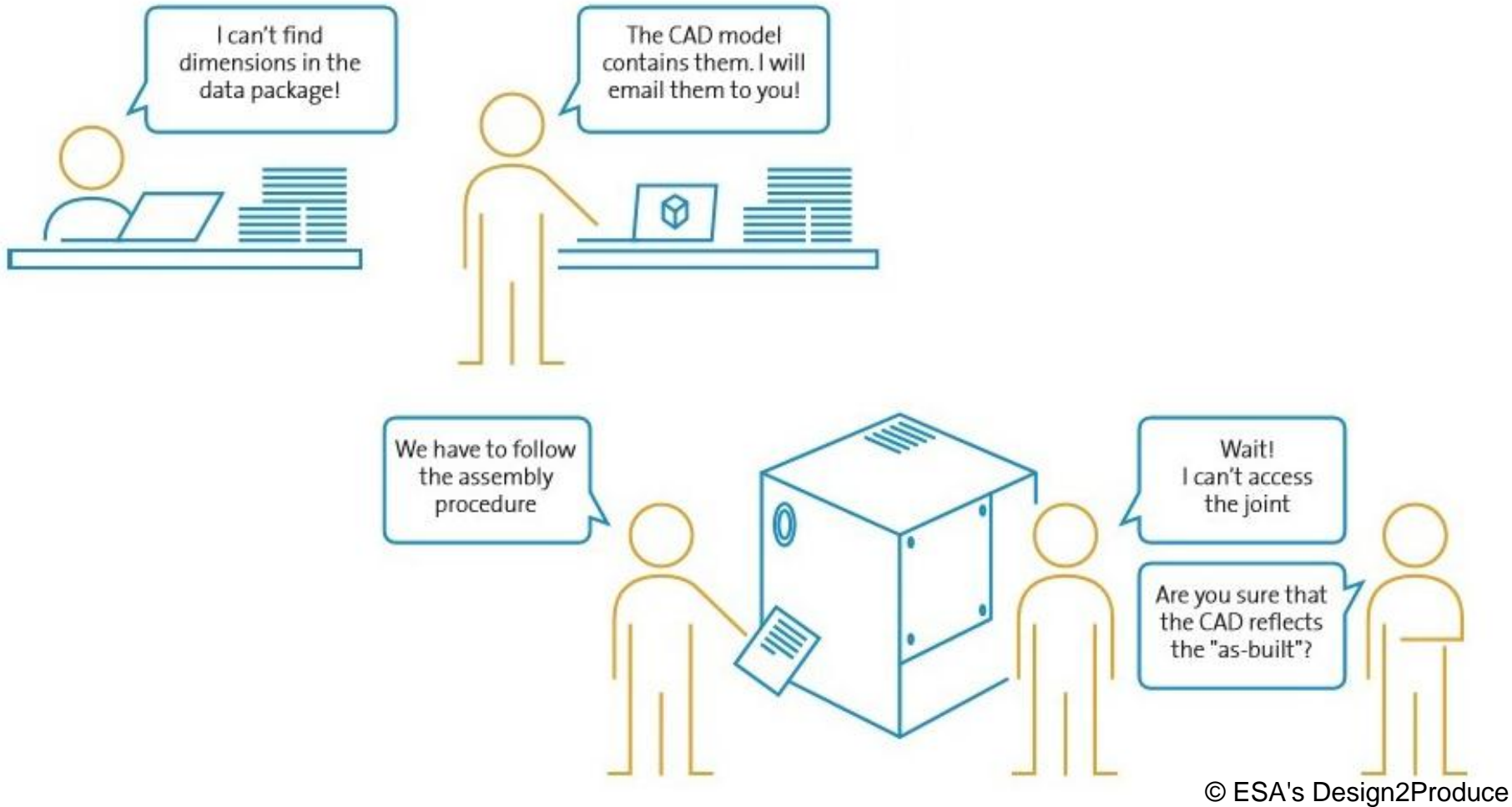
SOLAR ORBITER

HOW MANY TEST WERE NEEDED?

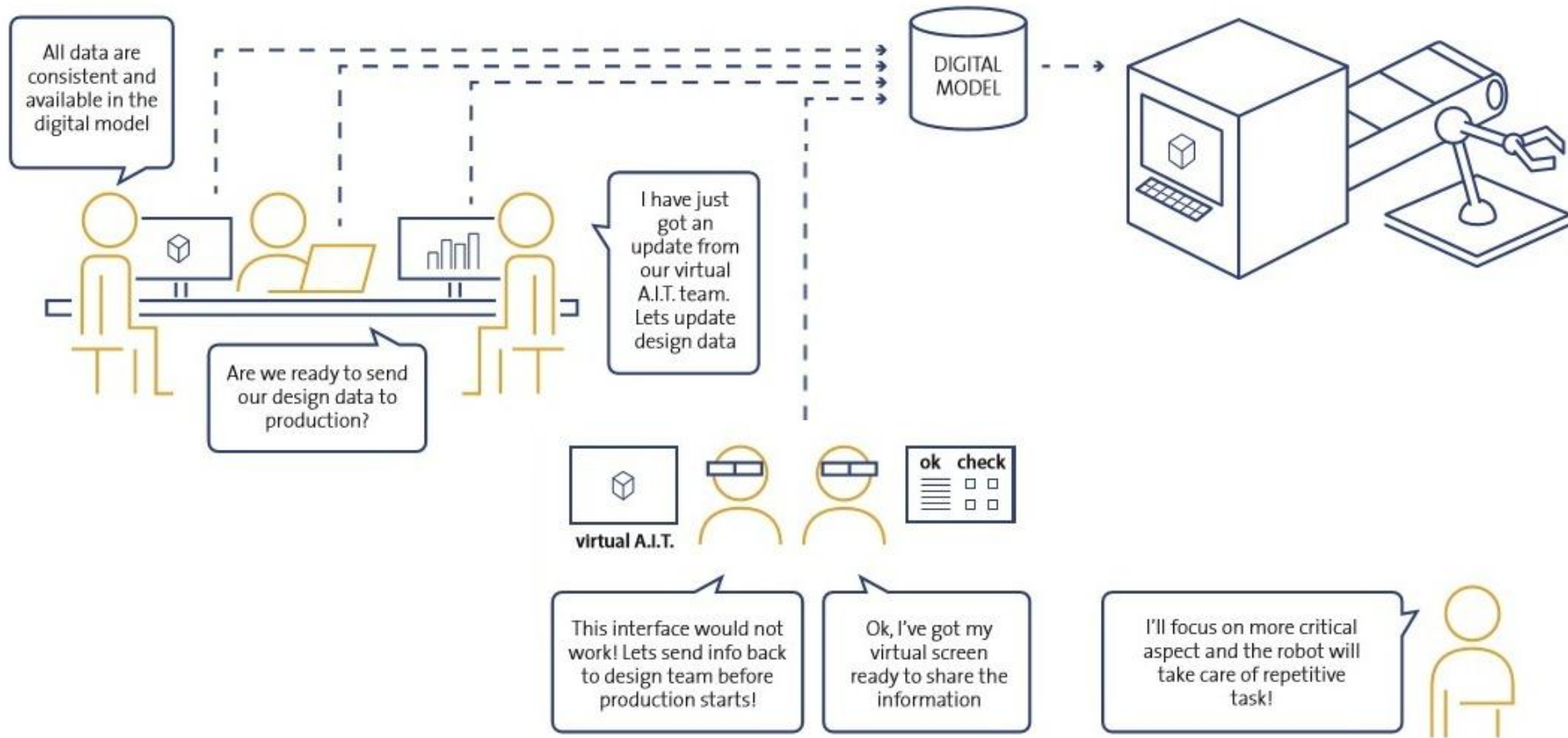
EVALUATION & SCREENING FLOW



WHAT HAPPENS WHEN SOMETHING HAPPENED?



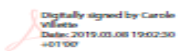

WHAT SHOULD HAPPEN BEFORE SOMETHING HAPPENS?



FIRST THINGS FIRST LOOK FOR ACCREDITED LABS

MEMO

I +31 (0)71 565 6565
F +31 (0)71 565 6040
www.esa.int

Date	7 th of March 2019	Ref	ESA-TECMSP-MO-013165
From	C. Villette  Carole Villette	Visa	T. Rohr  T. Rohr
To	SMT Approved assembly line, ESA PA Managers, ESA skills training school, ESA recommended microsectioning facilities	Copy	G. Corocher, J. Hokka, E. Peraud, S. Heltzel

Subject: ESA recommended microsectioning facilities

The following facilities are ESA recommended for inspection, microsectioning and assessment of the microsectioning of assembled devices mounted on verification boards, having been submitted to a verification programme in compliance with ECSS-Q-ST-70-07C, ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C.

The competencies of the laboratories have been assessed by ESA in compliance with ESA-TECMSP-MO-013161 (www.escies.org). These companies are considered as Category A as described in the ESA-TECMSP-MO-013162 (www.escies.org).

These companies may also provide expertise in the field of unpopulated Printed Circuit Board microsectioning.

The list of companies is uploaded on the escies website (www.escies.org).

Alter Technology TUV

Mr. Manuel Dominguez
Tomas Alba Edison 4

FIRST THINGS FIRST LOOK FOR ACCREDITED LABS



DEFENSE LOGISTICS AGENCY
LAND AND MARITIME
POST OFFICE BOX 3990
COLUMBUS, OH 43218-3990

Mr. Jose Andres Izquierdo
Alter Technology TUV Nord S.A.U.
C/ Tomas A. Edison 4
41092 Sevilla, Spain

October 28, 2014

Dear Mr. Izquierdo:

Re: Laboratory Suitability Status, MIL-STD-750 and Mil-STD-883; FSC 5961 and FSC 5962;
VQE-15-028801; Control Number 044647.

This office has received and approved submitted corrective actions to the findings from your facility audit of May 8, 2014. As a result, your facility at the above address is considered suitably equipped to perform testing of QML-19500, QML-38534, and QML-38535 compliant devices for the following test methods:

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FIRST THINGS FIRST LOOK FOR ACCREDITED LABS

Acred

ALTER TECHNOLOGY TÜV NORD, S.A. (Unipersonal)

Según criterios recogidos en la norma UNE-EN ISO/IEC 17025, para las actividades de ENSAYO definidas en el ANEXO TÉCNICO nº 345/LE2116.

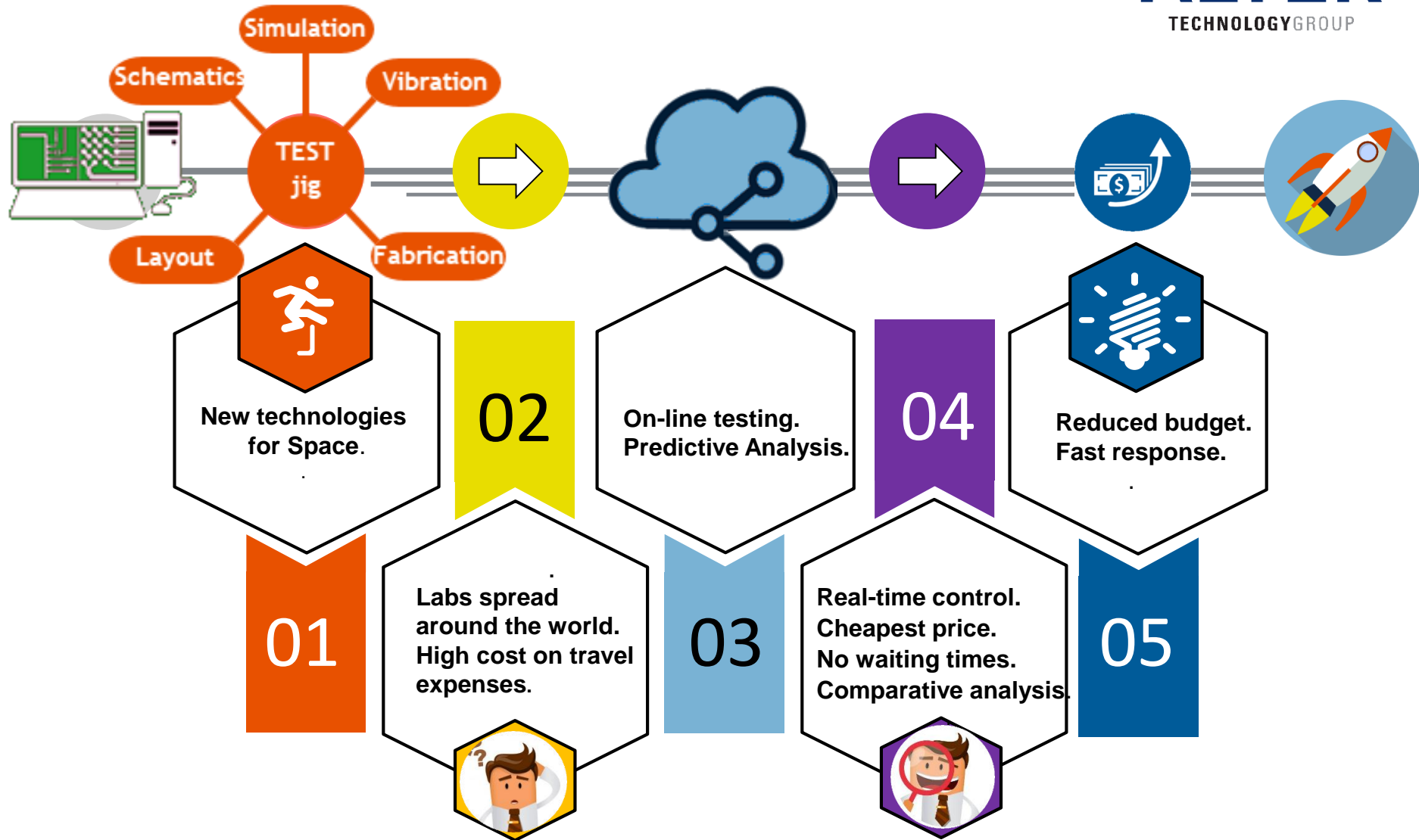
According to the criteria in the standard UNE-EN ISO/IEC 17025 for the Testing activities defined in the Technical Annex No 345/LE2116.

Fecha de entrada en vigor / Coming into effect: 14/03/2014



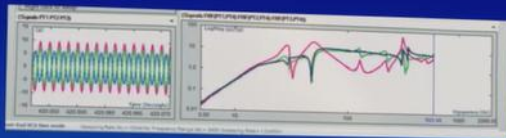
D. José Manuel Prieto Barrio
Presidente

HOW DOES IT WORK?



HOW DOES IT WORK?

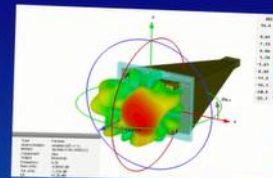
Monitoring Virtual Lab
WARNING: component under test, few parameters are being degraded...



100 %



Vibration test



100 %



Radiofrequency test



100 %



Soldering Verification Test



Ready to start

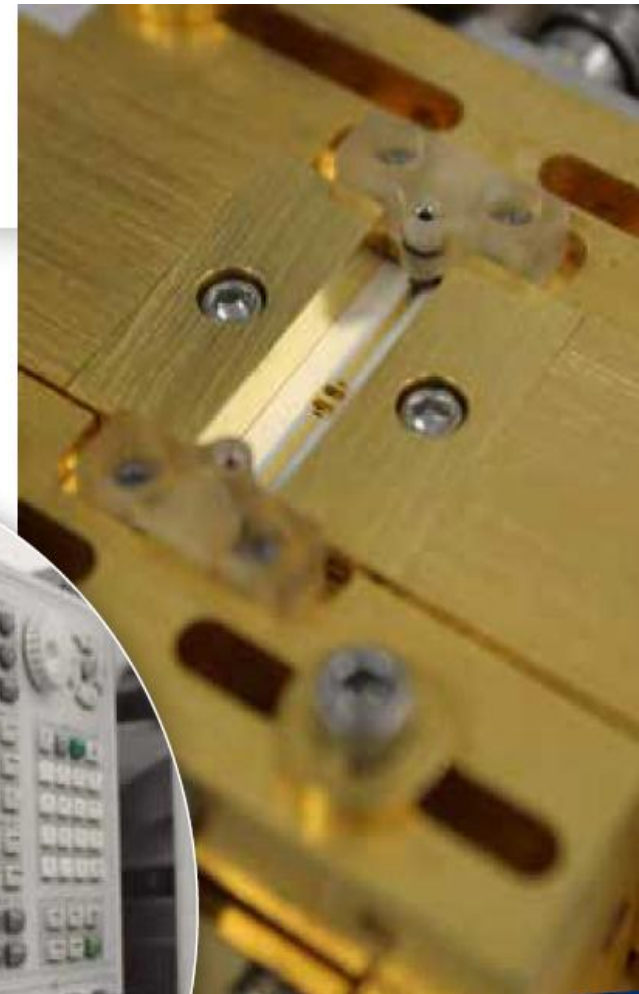
Radiation Test

Experts in design, packaging and testing of high reliability components

ALTER TECHNOLOGY GROUP has accumulated significant experience over more than 30 years participating in many ESA projects, and for Space agencies worldwide.

MAIN ACTIVITIES:

- ✦ EEE engineering, testing and procurement
- ✦ Microwave design, packaging and test
- ✦ Certification of equipment.

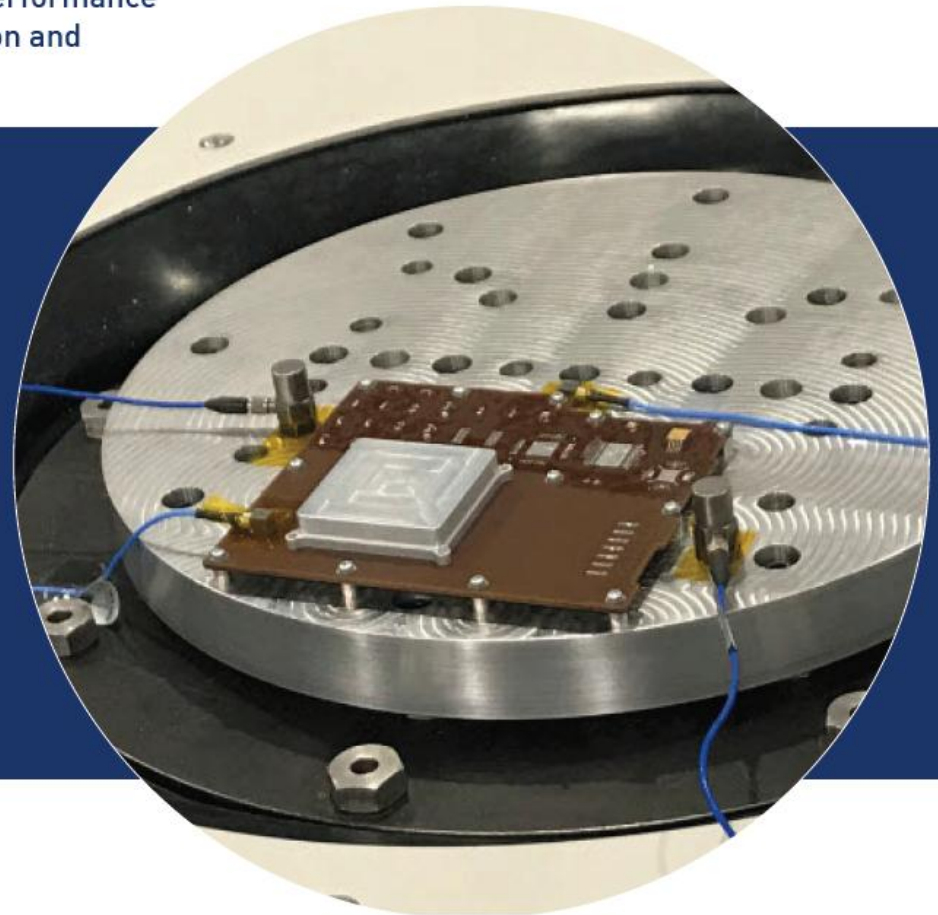


Vibration testing is performed to validate the reliability, performance and structural integrity of a device during its transportation and useful life, avoiding life failure in space.

Vibration testing mimics the conditions such as those encountered during a rocket launch to verify mechanical robustness.

OUR VIBRATION TESTS:

- Components
- PCBs
- Equipments

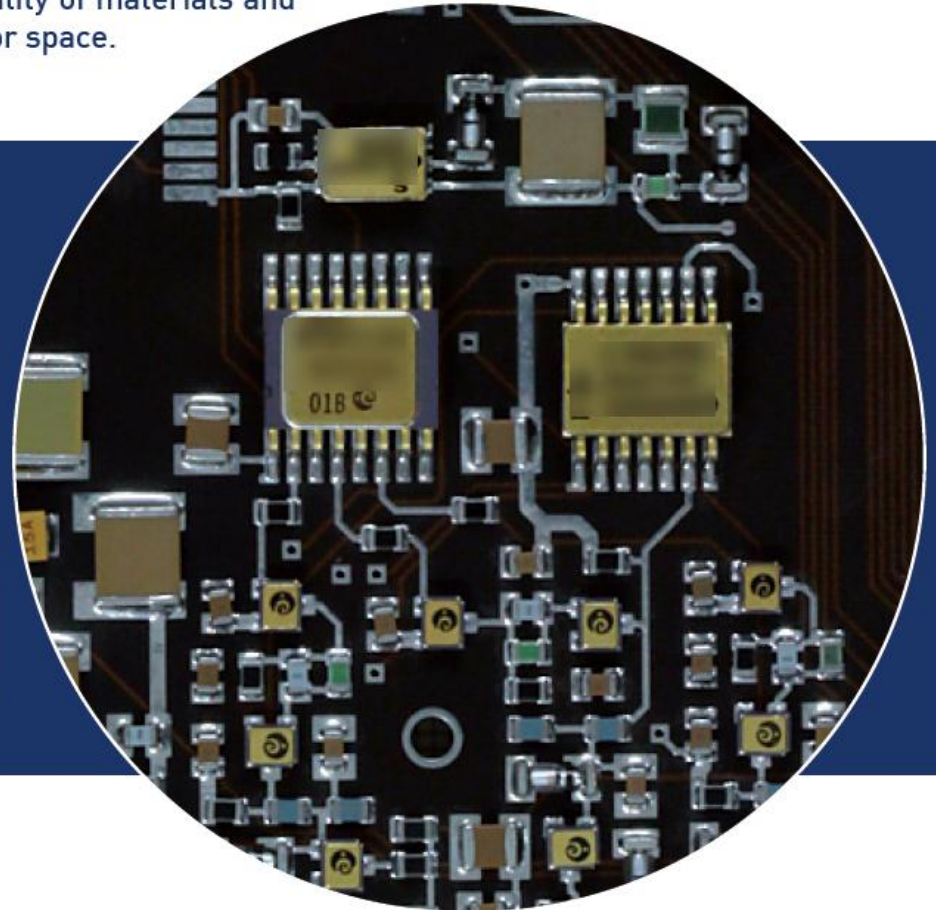


MATERIALS AND PROCESSES LABORATORY

The mission of this area is to thoroughly assess the reliability of materials and processes involved in the manufacturing of components for space.

It involves these interrelated activities

- Soldering Verification and PCB
 - Visual Inspection
 - Vibration & Shock Testing
 - Temperature Cycling
 - Microsection Evaluation
- Failure Analysis



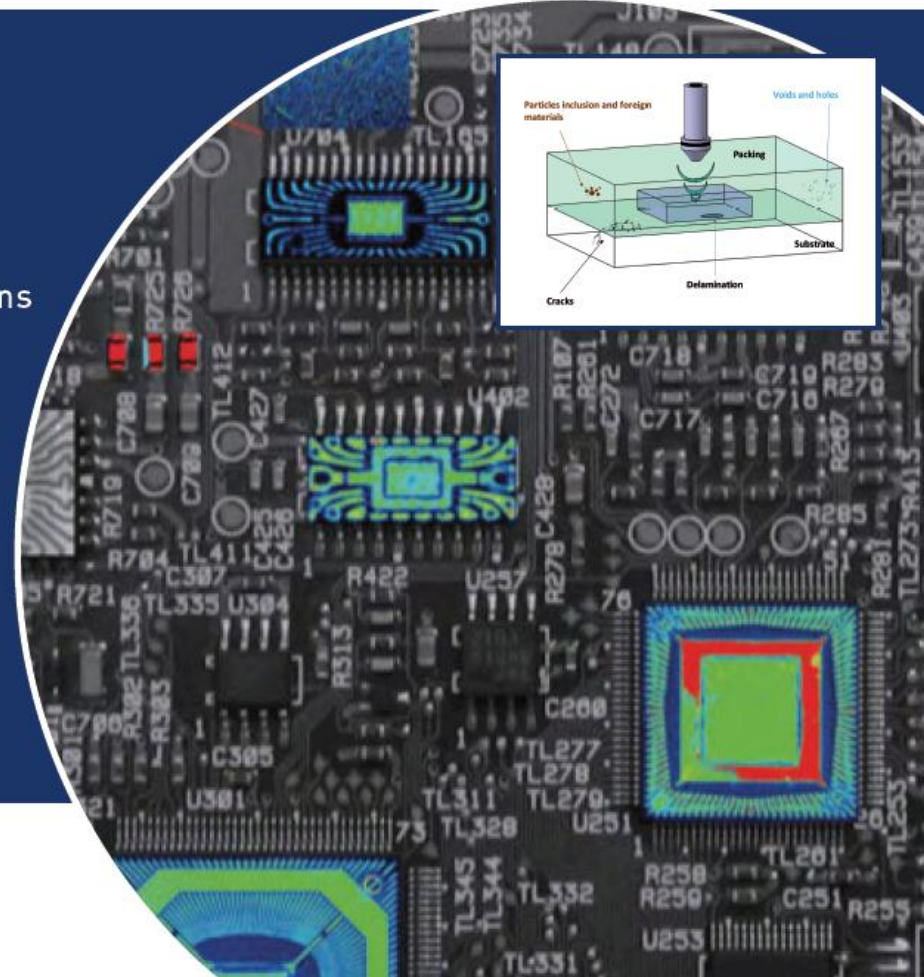
SCANNING ACOUSTIC TOMOGRAPHY

Main Activities

- Reliability tests
- Quality control & screening.
- Failure analysis

Main Characteristics

- Detection of ultra-thin (submicrometric) delaminations in multilayer systems.
- Micrometric lateral resolution and detection of submicrometric features.
- 3D Tomographic reconstruction.
- Relabelling detection in counterfeit systems.
- High sensitivity to voids in/on low density materials (e.g. plastic encapsulation, PCBs, organic underfills, low-k inter-layer dielectrics (ILD)...) and transparent to x-ray materials.
- Compatibility with x-ray opaque (thick metal) substrates and coatings.





INNOVATION

TAP COMMERCIAL INNOVATION

Access data
wherever they are

CONNECT ENGINEERS WITH MACHINES (M2M)

Predictive
Analysis

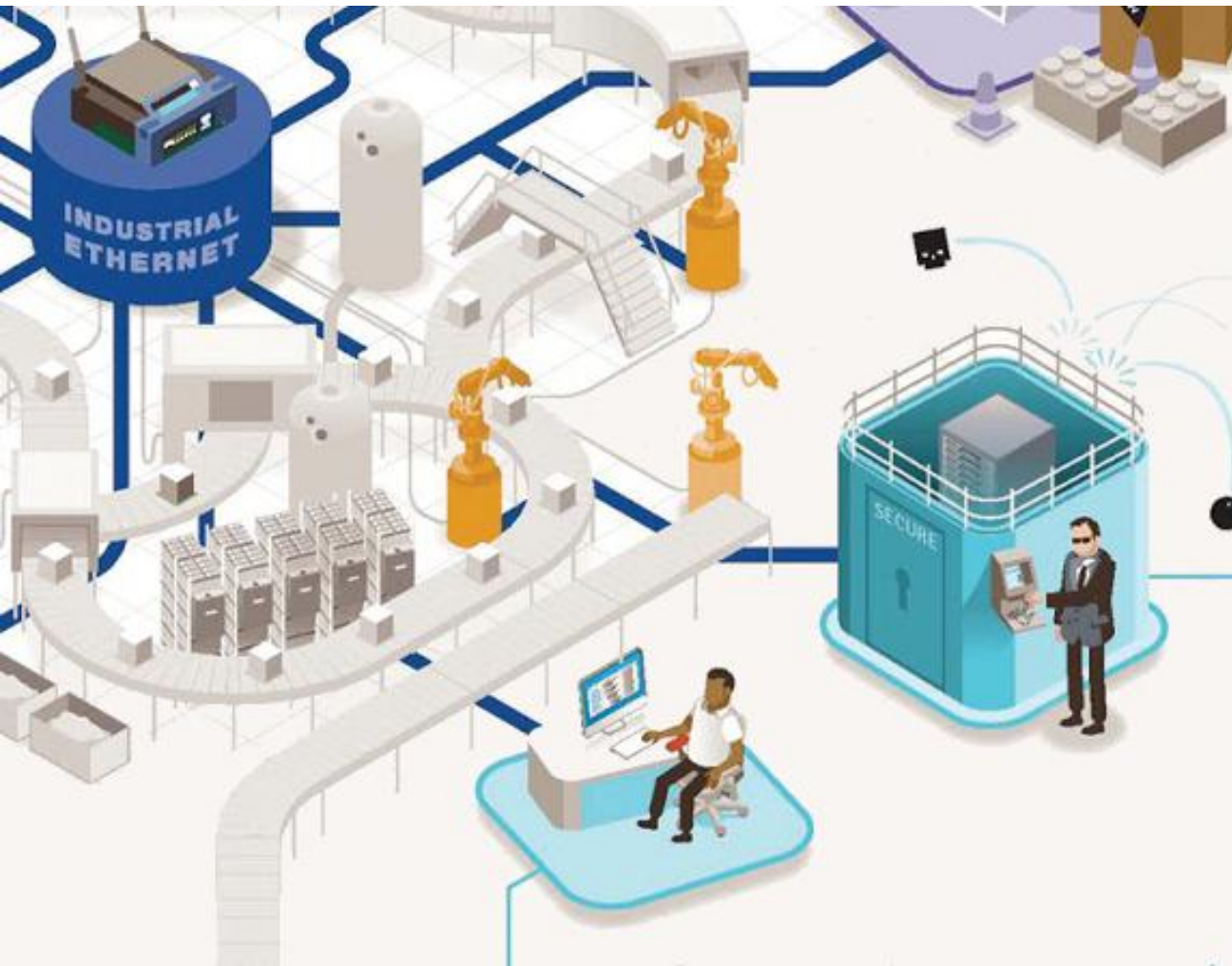


I see the
problem



AGILITY

Help and
expertise
are available
in an instant



RISK

**Secure
networks
to protect
your
processes**



EFFICIENCY

LINK INFORMATION & OPERATIONAL TECHNOLOGY

Full connectivity

OPTIMIZE ASSETS

Adjust the schedule, test results and inventory on the fly



ALTER

TECHNOLOGYGROUP

Our Lab and knowledge at your fingertips

THANK YOU!

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March, 13th 2019 – ESCCON 2019

TÜV NORD GROUP

