



RELAY DAY 2017

The debut of “Relion 2.2”

The new IEDs generation

“A suitable portfolio for your digital substation”

Miguel Lara Mendoza – Sales Manager

Factory worldwide

- Caribbean & Central America
- Colombia
- Ecuador
- Peru
- Chile
- Paraguay
- Bolivia
- Uruguay
- Argentina
- Venezuela
- Suriname, Guyana & G Fran.
- Brazil ★



Miguel Lara Mendoza
Sales Manager
+5511986020540
miguel.mendoza@br.abb.com



The Past



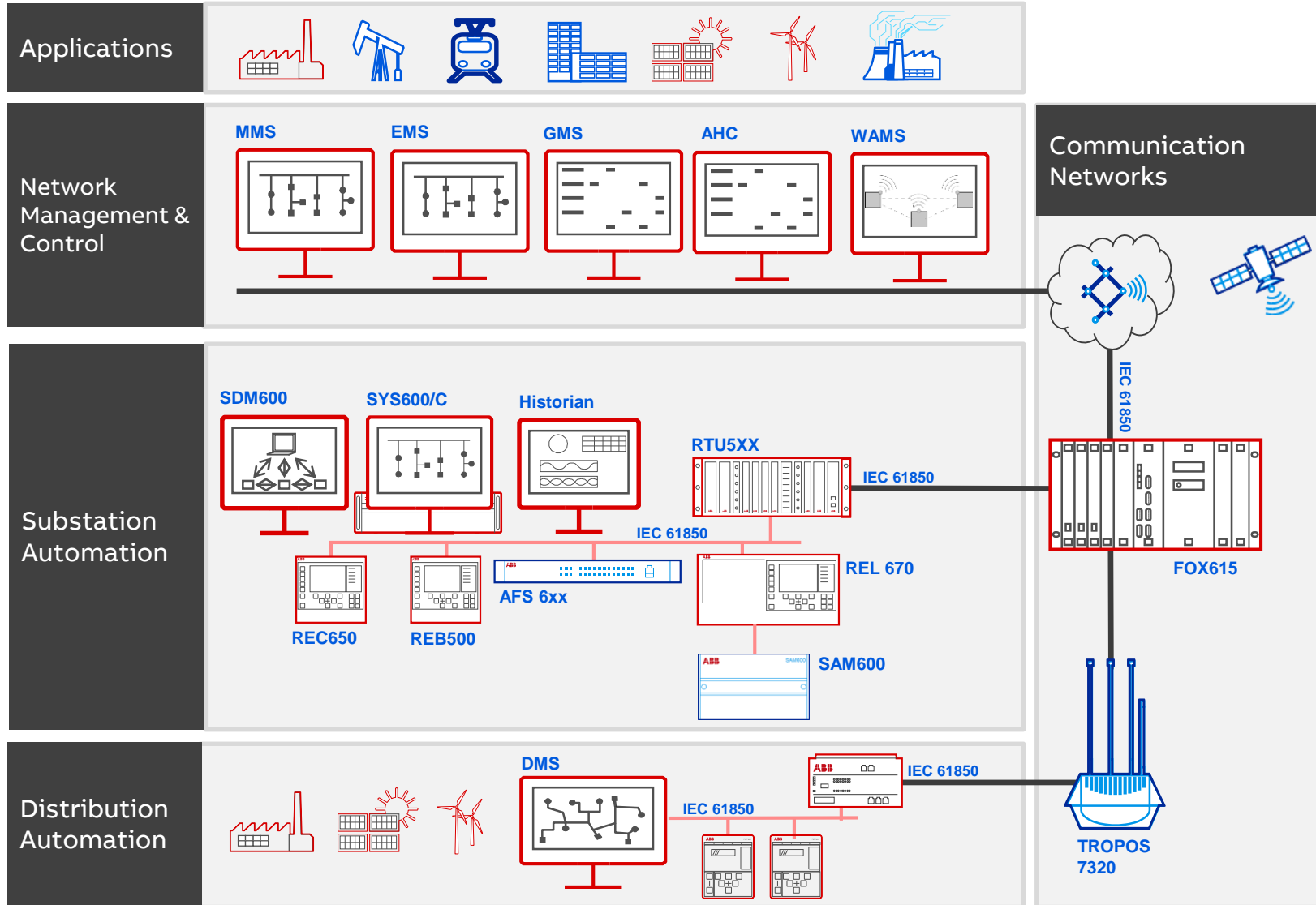
The Past



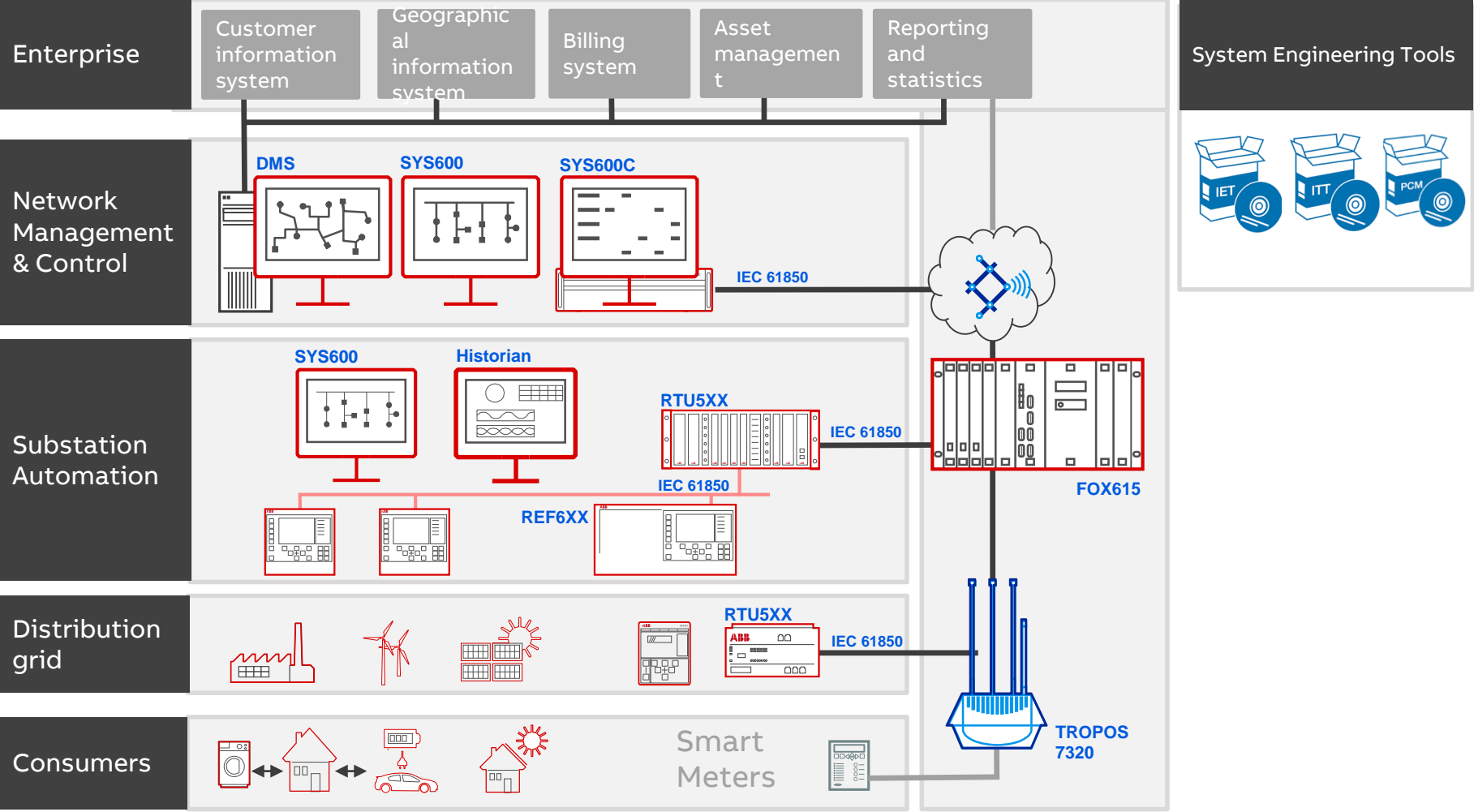
The present



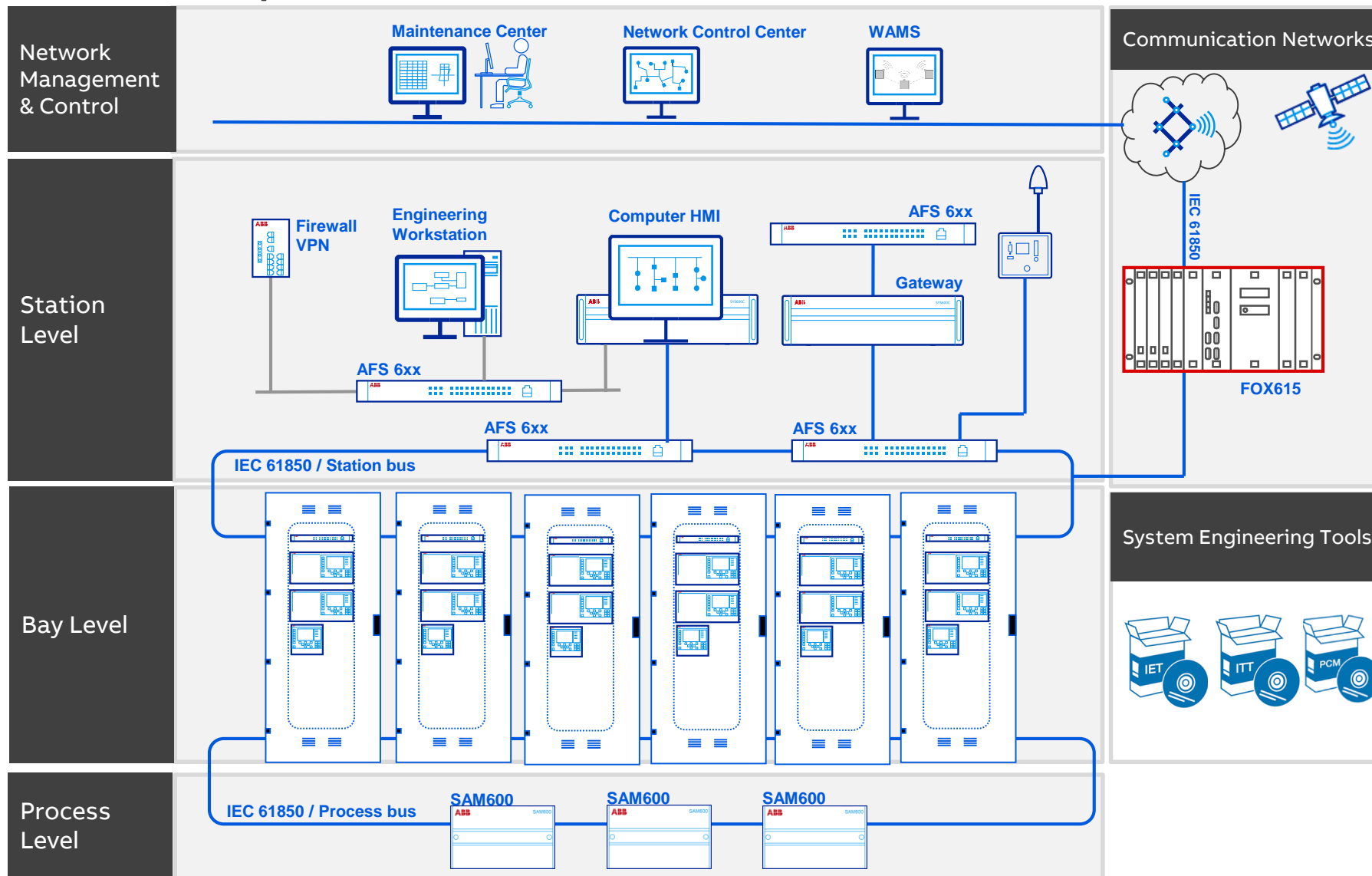
Portfolio Overview



Substation Automation & Communication portfolio overview



Digital Transmission portfolio and architecture



More than 1 reasons you should buy ABB Relays?

Up to **“10 years”**
of warranty,
if the customer
needs.

A common
PCM600 tool
for Relion family.
It´s in **“Spanish”**
and **“Free Download”**

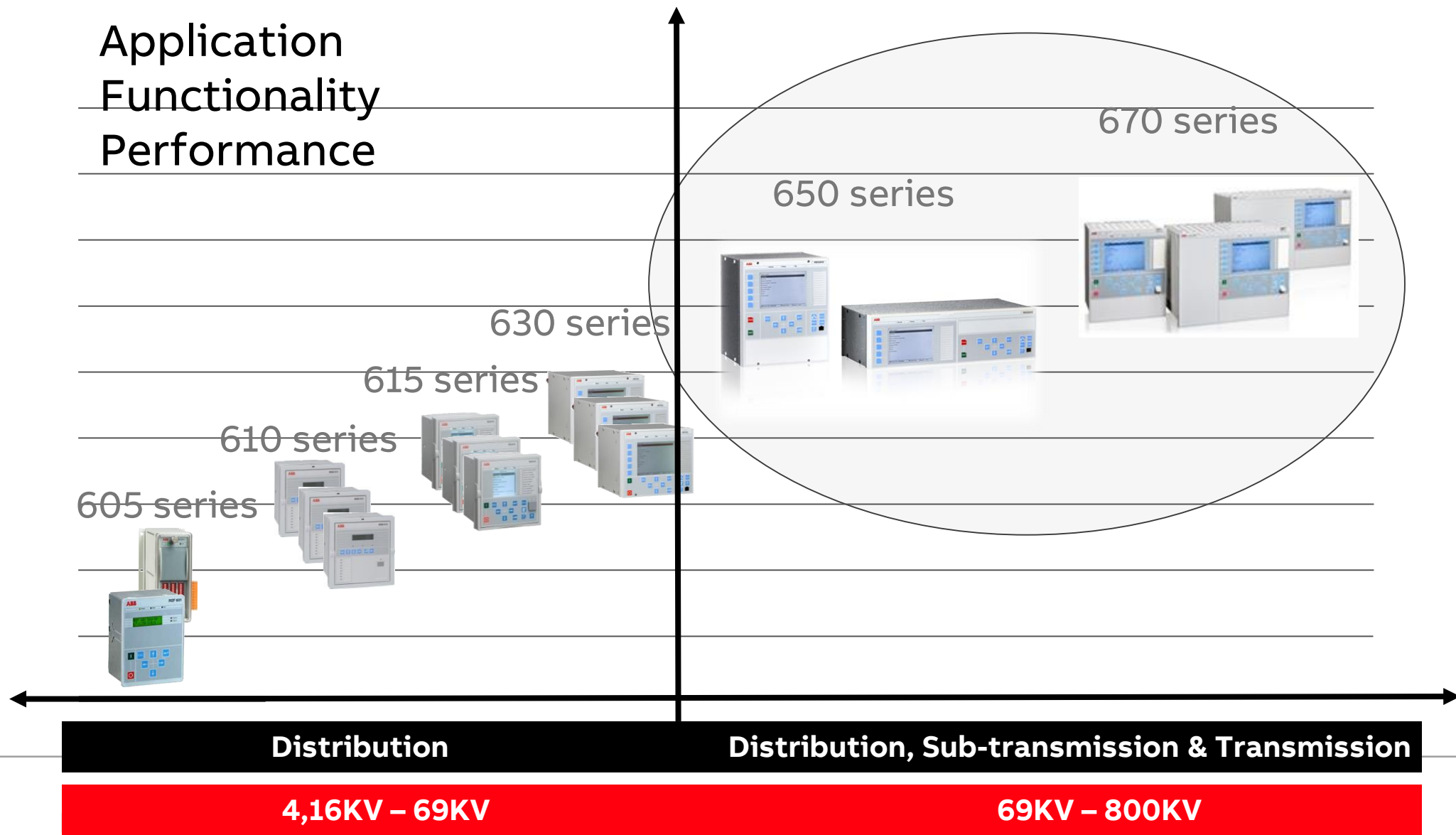
“10 years of Life Cycle”
plus
“10 years of Legacy”,
before
Obsolescence.

The
“unique IED factory”
in Latin America,
Relays made in Brazil
with technology from
Sweden.

**“Local
Technical Assistance
”** from and **“Regional
Free Support”**
in spanish,
365 days at year.

High ABB
technology, having
the only IED in the market
With a native IEC61850
protocol Ed 1 & Ed 2
without changes

Relion® Product Family - Positioning



Relion[®] 670 / 650 – The Power of one portfolio

- REB670 – **B**us-bar Differential protection
 - REC670 – Bay **C**ontrol Unit or Overcurrent
 - RED670 – Line **D**ifferential Protection
 - REG670 – **G**enerator Protection
 - REL670 – **L**ine Protection
 - RET670 – Power **T**ransformer Protection
 - RES670 – **S**ynchorfasor (PMU)
 - RER670 - **R**ailway
-
- REC650 - Bay **C**ontrol Unit or Overcurrent
 - REQ650 – **Q**uality (Feeder) Protection
 - REG650 - **G**enerator Protection
 - REL650 - **L**ine Protection
 - RED650 - Line **D**ifferential Protection
 - RET650 - Power **T**ransformer Protection
 - REB650 – **B**us-bar Differential protection

Control breaker/Switchgear: 30



Control breaker/Switchgear: 11

Relion® 670 / 650 – Active Products

650s – v.1.1 & v.1.3



670s – v.1.1, v.1.2, v.2.1



Relion® 650 - Brief

650s – v.1.1 & v.1.3



650 v.1.1

- Variants REC, REL, RET, REB (high Z), REG, REQ
- Rack ½ 19" 6U
- Operation without HMI functionality
- 1 Ethernet port
- IEC61850 Edition 1

650 v.1.3

- Same variant like v.1.1 / Rack 19" 3U
- 2 Ethernet ports – Dual drive PRP
- IEC61850 Edition 1

Relion® 670 - Brief

670s – v.1.1, v.1.2, v.2.1



670 v.1.1

- All variants REC, REL, RET, RED, REB, REG
- 2 Independent Ethernet ports – GOOSE in 1 port
- IEC61850 edition 1

670 v.1.2

- All variants + RES670 (PMU) C37.118-2005
- 2 Independent Ethernet ports – Dual drive PRP
- IEC61850 Edition 1 and Edition 2

670 v.2.1

- All variants like v.1.2 + RES670 (PMU) C37.118-2011 + new platform + new look&feel
- IEC61850 Edition 1 and Edition 2 via menu
- IEC61850-9-2LE – Process Bus
- Fast Distance protection < 1 cycle

Relion® 670 / 650 - What's new? - Major features

- Higher capability for process bus (IEC61850-9-2LE) + Goose supporting 100% digital substations.
- Redundant Ethernet ports (6 in 670 & 4 in 650)
- Support of IEC 61850 Ed. 1 and Ed.2 in the same product without firmware change.
- PMU functionality in REC, RED, REL and RET
- HSR and PRP redundancy in the same box using all protocols according iec 62351-8)
- Multi-object capability having up to 24 Analog as a mix I/V
- Improved protection as conformal coating class IP40/IP54 (closed box) for harsher environmental.
- PTP Time synchronization plus PPS, IRIG-B, GPS with high accuracy according IEC 61850-9-3 (IEEE 1588)
- Sub-Cycle distance and differential protection tested according IEC 60255-121
- Long range direct fiber communication up to ~60km
- Increased accuracy in fault location in power networks to less than 1%
- 6 zone busbar protection improved (1 phase).
- Binary Inputs/outputs can be forced in the IED for test and commissioning purposes.
- Increased number of binary of disturbance recording channels from 96 to 352 in order to capture all important information for 24 bays.
- Flexible Product Naming (FPN), Enabling the IEC 61850 client to see names of logical nodes, parameters, attributes etc., as per its own definition
- Cyber security support for compliance to NERC CIP and IEC 62351-8, Preventing unauthorized access to IEDs. Facility to change certain settings remotely using IEC 61850 protocol.
- Improved HMI for visualization of the single line diagram with virtual keyboard, function push buttons and three color LED indications with alarm descriptions
- Same hardware as 670 / 650



Relion® 650 series

DNV-GL(KEMA) Conformance Test - IEC 61850 Ed2, IEC 60870 -5-103 and DNP 3.0 conformance certificate

IEC 61850 Ed2

UCA
International Users Group

IEC 61850 Certificate Level A¹

No. 10004038-OPE/INC 15-2826

Issued to:
ABB AB
SA Products
S-721 59 Västerås
Sweden

For the server product:
REC670 Bay Control
Software version: 2.1.0.23
S/N: REC670 2.1.0.16

The server product has not been shown to be non-conforming to:

IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems for power utility automation

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Server Test Procedures version 1.0 with TPCL¹ 1.0.2 with product's protocol, model and technical issue implementation conformance statements, "Protocol Implementation Conformance Statement for the IEC 61850 interface in ABB 650 and 670 series version 2.1 - IEC 61850 Edition 2, IMR0201052", "Model Implementation Conformance Statement for the IEC 61850 E62 interface in ABB 650 and 670 series version 2.1, IMR0201098" and "TSSES Implementation Conformance Statement for the IEC 61850 E62 interface in ABB 650 and 670 series version 2.1, IMR0201051" and the extra information for testing: "Protocol Implementation extra information for Testing (PIKIT) for the IEC 61850 interface in ABB 650 and 670 series version 2.1 - IEC 61850 Edition 2, IMR0201053".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

1 Basic Exchange (22/26)	9a GOOSE Publish (8/13)
2 Data Sets (4/7)	9b GOOSE Subscribe (13/14)
3 Substitution (3/3)	12a Direct Control (12/18)
4 Setting Group Selection (4/4)	12b Enhanced SBO Control (19/28)
4+ Setting Group Definition (12/13)	13 Time Synchronization (6/7)
5 Unbuffered Reporting (17/20)	14 File Transfer (7/8)
6 Buffered Reporting (23/29)	15 Service Tracking (12/17)

This certificate includes a summary of the test results as carried out at ABB in Sweden with UniCA 61850 Client Simulator 4.29.03 with test suite 802_3_29_05 and UniCA 61850 Analyzer 5.28.02. This document has been issued for information purposes only, and the original paper copy of the DNV-GL verification report No. 7418086-OPE/INC 15-2824 will prevail.

The test has been carried out on one single specimen of the product as referred above and submitted to DNV GL by ABB. The manufacturer's production process has not been assessed. This certificate does not imply that DNV GL has approved any product other than the specimen tested.

Amhem, October 1, 2015

M. Adriaansen
Head of Department
Operational Excellence

DNV-GL
2200 SØSKOVVEJ • 8000 BØVENSE

R. Schimmel
Verification Manager

¹Level A - Independent test lab with certified ISO 9001 Quality System
²TPCL - Test procedures change list

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KEMA Nederland B.V. Utrechtseweg 315, 8812 AR Arnhem, P.O. Box 9035, 6800 ET Arnhem, the Netherlands
T +31 26 385 2025 F +31 26 381 30 83 sales@kema.nl www.kema.nl

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IEC 60870-5-103

DNV-GL

ATTESTATION OF CONFORMITY

No. 10004038-OPE/INC 15-3092

Issued to:
ABB
SA Products
Nätverksgratan 3, 8391, Finnsletten
721 59 Västerås
Sweden

For the client system:
REL 670
Type: Slave station
Product version 2.1.0
Firmware version 2.1.0.17

With the implemented communication protocol:

IEC 60870-5-103 (IS 1998)

Companion Standard for the informative interface of protection equipment and the ABB Relion 650 and 670 series version 2.1 IEC 60870-5-103, Interoperability, dated August 28, 2015.

The product has not been shown to be non-conforming to the specified protocol standard, including the interface requirements.

End-to-end data element tests for the information and control points as described in manufacturer Protocol Implementation Conformance Statement (PICS) have been performed on the product's protocol implementation. Functional tests in controlled mode are performed for the following levels:

• Station initialization in unbalanced mode	• General command
• Cyclic data transmission	• Clock synchronization
• Acquisition of events	• Transmission of Disturbance records
• General interrogation	• Test mode and local parameter setting

The test campaign did not reveal any errors in the product's protocol implementation.

This Attestation is granted on account of tests made at location of ABB in Västerås, Sweden and performed with UniECan version 3.0.3 (2014) running CS103 Test Suite version CS103MasterNormal 2.4. The results, including remarks and limitations, are laid down in our report no. 10004038-OPE/INC 15-3086.

The tests have been carried out on one single specimen of the product, submitted by ABB. The Attestation does not include an assessment of the manufacturer's production. Conformity of his production with the specimen tested by DNV GL is not the responsibility of DNV GL.

Amhem, November 18, 2015

P. Cioch
Head of Section
Operational Excellence

DNV-GL
2200 SØSKOVVEJ • 8000 BØVENSE

G. Webber
Test Consultant

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DNP 3.0

Users Group
A FORUM FOR SUPPORTERS OF THE DISTRIBUTED NETWORK PROTOCOL

Distributed Network Protocol

This certificate confirms that the device described below has successfully complied with the requirements as outlined by the DNP 3.0 Technical Committee's DNP 3.0 Conformance Testing procedure. This certificate entitles the bearer to promote the below stated device as having fully passed the DNP 3.0 Subset Definitions v2.6 rev1.

Manufacturer: ABB
Device Model: REC 670 v2.1.0
Firmware Number: 2.1.0.23
Level Successfully Passed: Level 2
Testing House: DNV-GL

Date: October 16, 2015

Tester: G. Akse

dnpp
Distributed Network Protocol
Level 2
Passing
Conformance

7418086-OPE/INC 15-2980

Relion® 670 series

DNV-GL(KEMA) Conformance Test - IEC 61850 Ed2, IEC 60870 -5-103 and DNP 3.0 conformance certificate

IEC 61850 Ed2

UCA
International Users Group

IEC 61850 Certificate Level A¹

No. 10004038-OPE/INC 15-2826

Issued to:
ABB AB
SA Products
S-721 59 Västerås
Sweden

For the server product:
REC670 Bay Control
Software version: 2.1.0.23
S/N: REC670 2.1.0.16

The server product has not been shown to be non-conforming to:

IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems for power utility automation

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Server Test Procedures version 1.0 with TPCL¹ 1.0.2 with product's protocol, model and technical issue implementation conformance statements, "Protocol Implementation Conformance Statement for the IEC 61850 interface in ABB 650 and 670 series version 2.1 - IEC 61850 Edition 2, IMR021052", "Model Implementation Conformance Statement for the IEC 61850 Ed2 interface in ABB 650 and 670 series version 2.1, IMR021098" and "TSUSSES Implementation Conformance Statement for the IEC 61850 Ed2 interface in ABB 650 and 670 series version 2.1, IMR021051" and the extra information for testing: "Protocol Implementation extra information for Testing (PIKIT) for the IEC 61850 interface in ABB 650 and 670 series version 2.1 - IEC 61850 Edition 2, IMR021053".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

1 Basic Exchange (22/26)	9a GOOSE Publish (8/13)
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Amhem, October 1, 2015

M. Adriaansen
Head of Department
Operational Excellence

R. Schimmler
Verification Manager

DNV-GL
220 8400 - www.dnv-gl.com

¹Level A - Independent test lab with certified ISO 9001 Quality System
²TPCL - Test procedures change list

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IEC 60870-5-103

DNV-GL

ATTESTATION OF CONFORMITY

No. 10004038-OPE/INC 15-3092

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SA Products
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721 59 Västerås
Sweden

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Type: Slave station
Product version 2.1.0
Firmware version 2.1.0.17

With the implemented communication protocol:

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DNV-GL
INTERNATIONAL USERS GROUP

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Firmware Number: 2.1.0.23
Level Successfully Passed: Level 2
Testing House: DNV-GL

Date: October 16, 2015

Tester: G. Akse

DNV-GL
INTERNATIONAL USERS GROUP

7418086-OPE/INC 15-2980



ABB