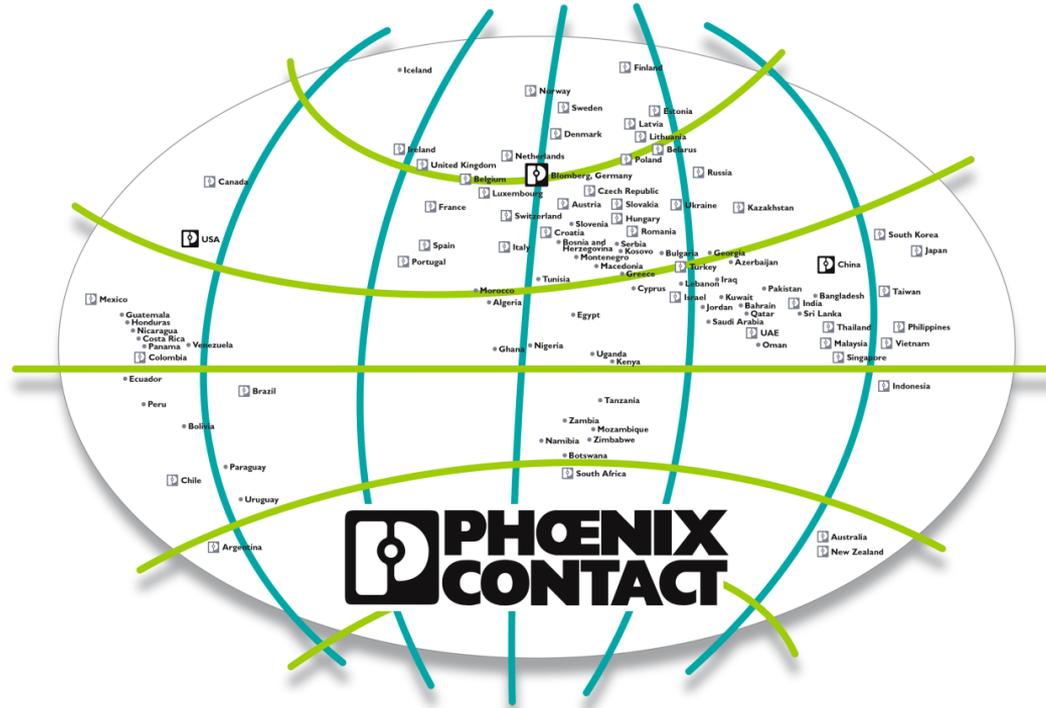


Ben Prier / Business Development Manager / March 2016

# Putting the Human into the Design



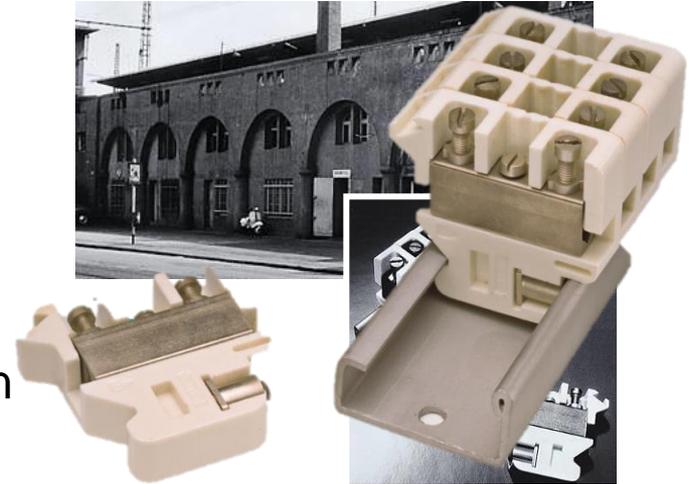
# Agenda

- Introduction
- Removing barriers to improve safety
- Implementing Change
- Looking down the road



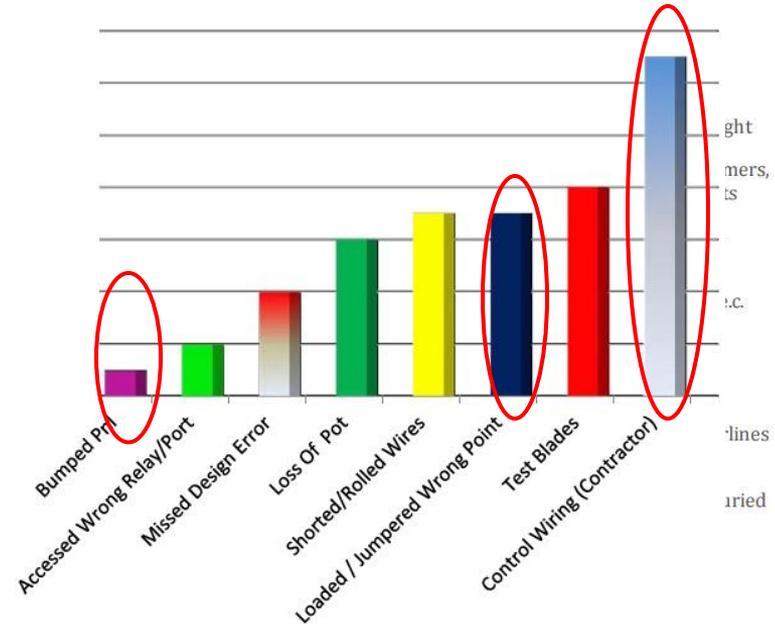
# Introduction

- Phönix Elektrizitätsgesellschaft (Phoenix Electricity Company) founded 1923
- 1928: The first modular terminal block developed for RWE (Rhine-Westphalia Electricity Works)
- Today, Phoenix Contact is the world leader in Industrial Connection Technologies
- Manufacturing on 3 continents with 50 subsidiaries and 14,500 employees worldwide.



# Removing Barriers to Improve Safety and Reliability

- 36% of non-fatal injuries are the result of contact with wiring, transformers, or other electrical components
- Human performance and workforce capability directly impact overall reliability
  - Unintentional contact (hardware or tools)
  - Improper torque values
  - Poor/Incorrect labeling
  - Wiring Errors



# Removing Barriers to Improve Safety and Reliability

- Barrier-style ring lug terminals have been the defacto standard in the US electric utility industry since the 1950s
- 66/110 punch down style blocks utilized in specialized communication applications
- Some screw clamp terminals



# Implementing Change

- First and foremost are industry standards.
  - ANSI/UL 60947-7-1/IEC60947
  - These standards do not guarantee operator safety or system reliability!
  - What can we do?

**CE**

**UL**

**CSA**

**NOTICE OF COMPLETION  
AND  
AUTHORIZATION TO APPLY THE UL MARK**

**Certification Record**

| Customer   | Class  | File Number  |
|--|--|--------------|
| Phoenix Contact GmbH & Co. KG<br>8th Management Division<br>Boundary | 6208-01<br>WIRE CONNECTING DEVICES-Terminal Assemblies | 015031_0_000 |
| D. 50025<br>Germany  |  |              |

TO THE REQUIREMENTS OF CSA STANDARDS E221 200 I/6 AND 5 C. 1/6

\* Terminal blocks, heater type, screw connection, for solid and stranded copper insulated conductors as follows:

| Dr No  | Maximum Wire Size | Strap   | Wire Size | Type | V   | A  | Group Designation |
|--------|-------------------|---------|-----------|------|-----|----|-------------------|
| BT 1.0 | 26 AWG            | 1.4-1.3 | 16        | SL   | 400 | 10 | B/C               |
| BT 1.5 | 26 AWG            | 1.4-1.3 | 16        | SL   | 400 | 15 | B/C               |
| BT 2.0 | 26 AWG            | 1.4-1.3 | 16        | SL   | 400 | 20 | B/C               |
| BT 2.5 | 26 AWG            | 1.4-1.3 | 16        | SL   | 400 | 25 | B/C               |
| BT 3.0 | 26 AWG            | 1.4-1.3 | 16        | SL   | 400 | 30 | B/C               |

• Terminal blocks, for use with UL516 1/6 Standard for System as follows:

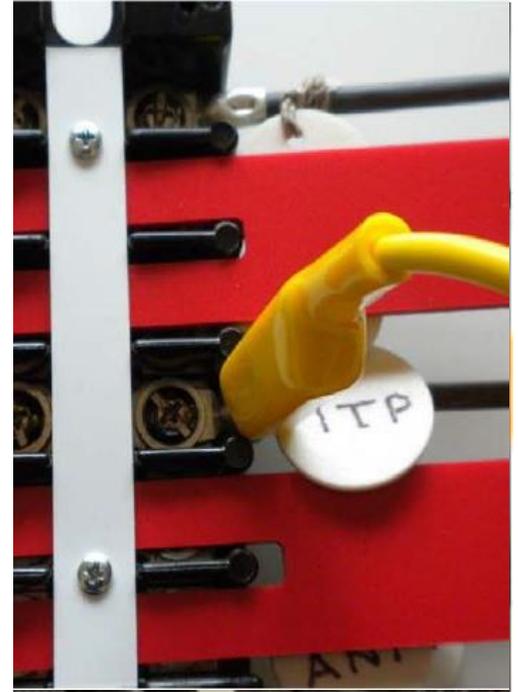
| Block     | Wire size (AWG) | V   | Current (A) | Strap (in. or mm) | Group Designation |
|-----------|-----------------|-----|-------------|-------------------|-------------------|
| BT200 6.1 | 24              | 400 | 31          | 1.31 x 0.25 (33)  | B/C               |

Note: Terminals shall not be followed by alpha numeric suffix denoting combination of classes and/or number of poles.



# Implementing Change

- What are the customer needs/requirements?
  - Isolation to prevent unintentional contact during testing or service
  - Clear labeling?
  - Test/Meter Point?
  - Clear method of safely shorting a CT?



# Implementing Change

Simple installation

Space savings

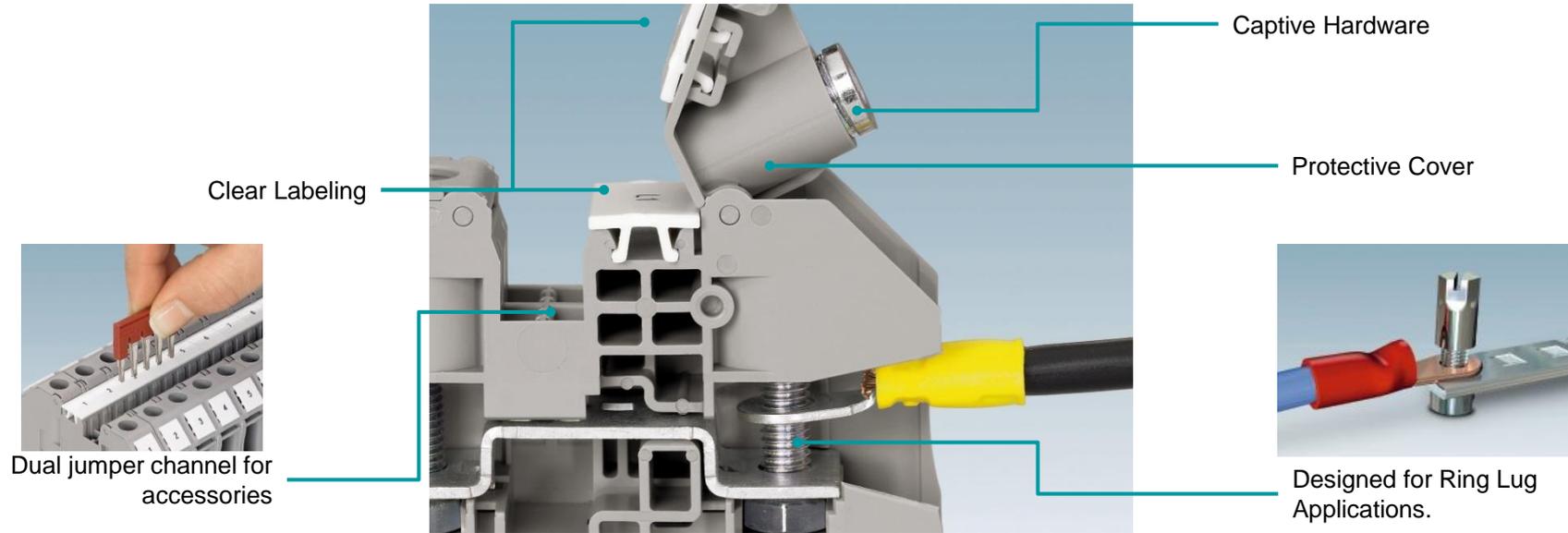
Clear marking

Time savings

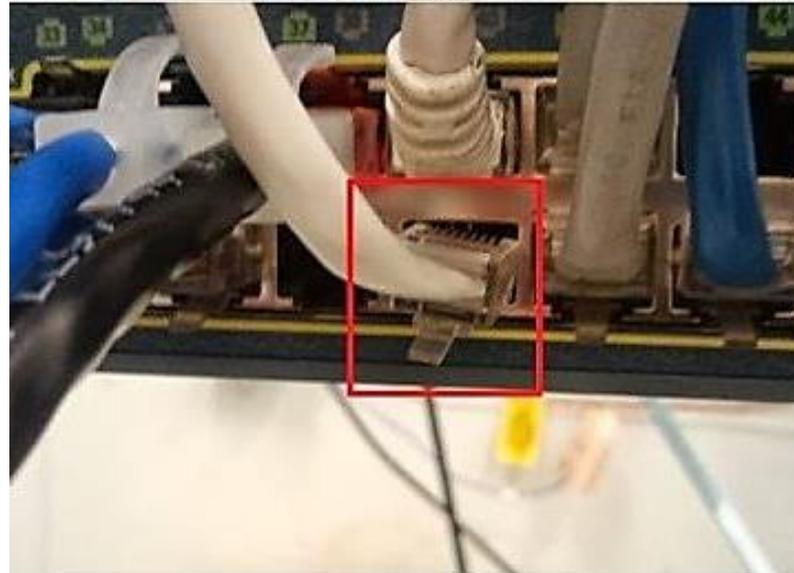
Reduction of inventory



# Implementing Change



# Implementing Change



Open Port Cap

Locking ring

Designed to accept  
Locking Ring.

# Looking Down the Road

- What other areas can benefit from this process?
  - CT and VT testing and maintenance is extremely critical to the grid and involves a great deal of knowledge, experience and training.
- Can we design in aspects to a product that greatly reduce these latent factors?



# Looking Down the Road

- Must fit within the established work area
- Utilize standard tool sizes
- Custom marking for clarity and improved operator communication
- Mirrored labeling to ensure proper wiring.
- Improved lockout features to prevent accidental operation during testing.
- Touch safe

