

Assessment of Dynamic Resistance Measurements

Practical Experiences

TF LTC Field Tests
IEEE/PES Transformers Committee
Spring 2018 – Pittsburgh, PA

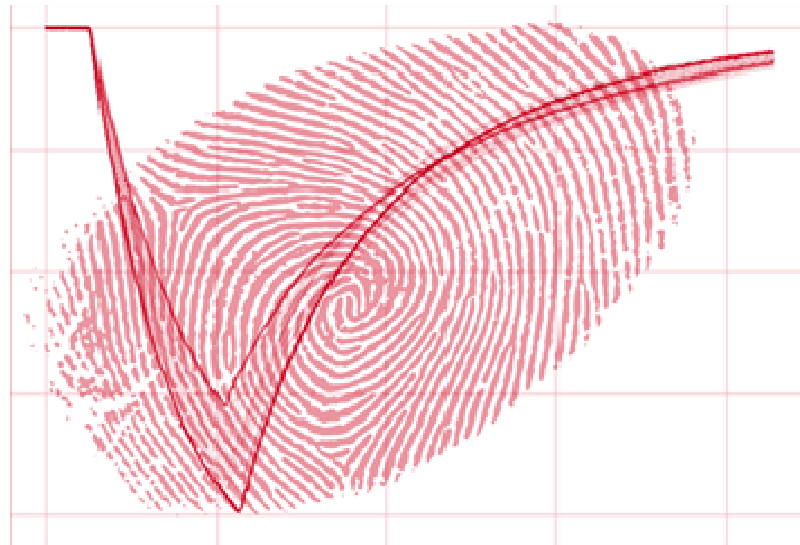
Cornelius Plath
OMICRON electronics

Practical Experiences – Assessment of DRM Results

- > Influences on the measurement
 - > Tap changer type and design
 - > Short-circuit on secondary side
 - > Magnitude of test current
 - > Voltage or Current source parameters
 - > Direction of switching (up or down)
 - > Oil Temp.

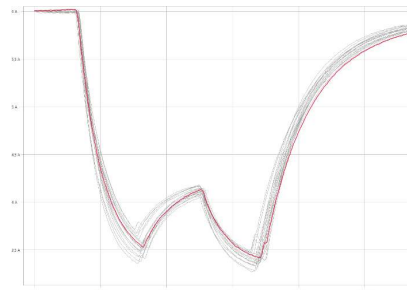
Assessment

- > Comparison to a fingerprint measurement
 - > Commissioning, before and after maintenance
 - > Perform with similar test current and shorting technique
- > Comparison to same type/design
 - > Consider Influence of Winding
 - > Perform with similar test current and shorting
- > Compare among
 - > Phases
 - > Direction
 - > Position (Even/Odd)

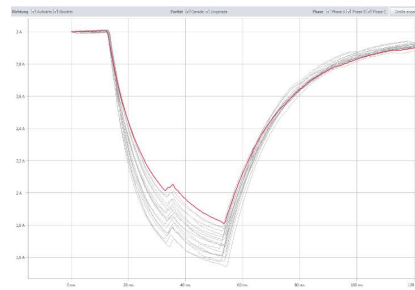


Assessment

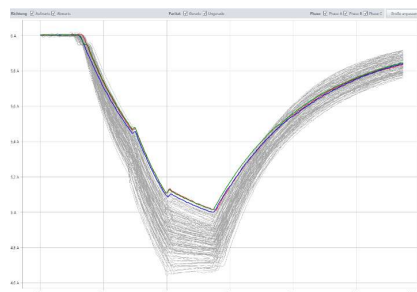
> Each tap changer type behaves differently.



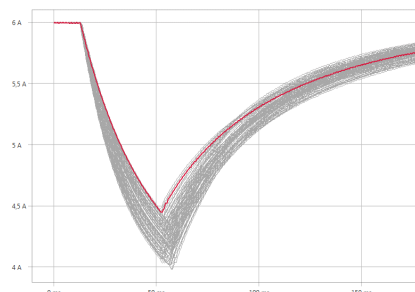
MR OILTAP®
V



MR OILTAP® M



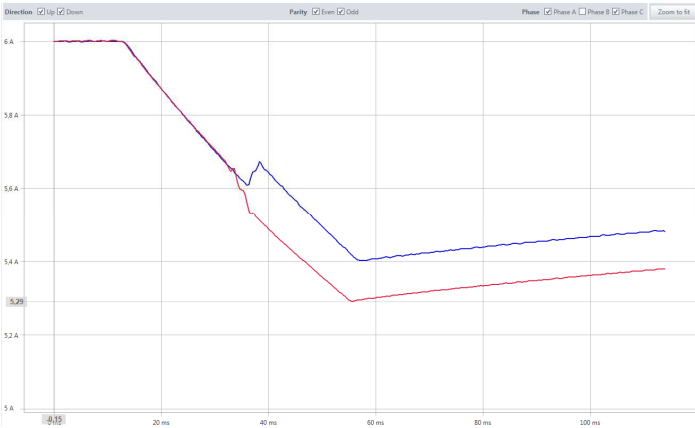
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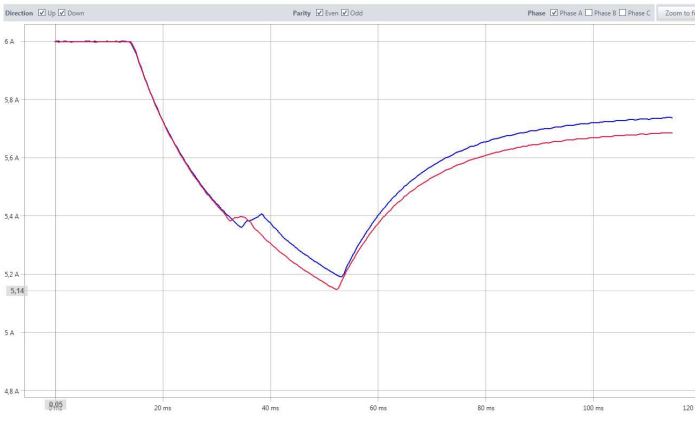
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Influence of Short-Circuit and Direction

No Short-Circuit on Secondary Side

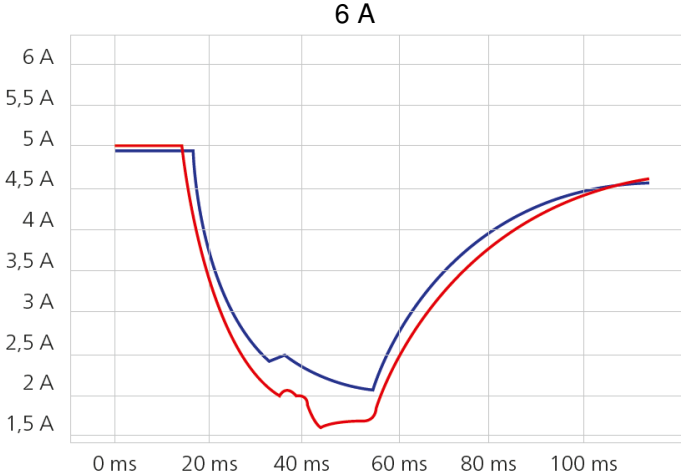
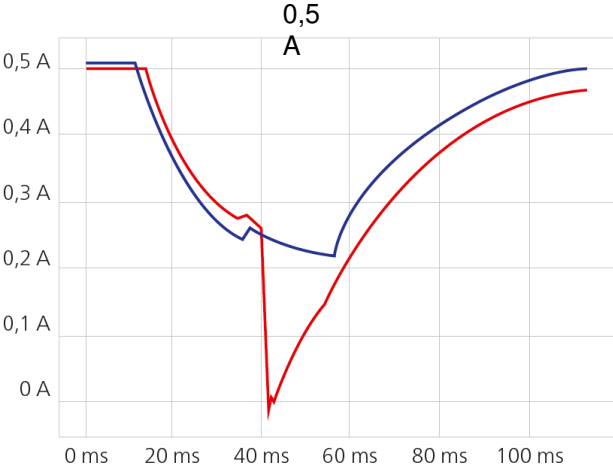


Short-Circuit on Secondary Side



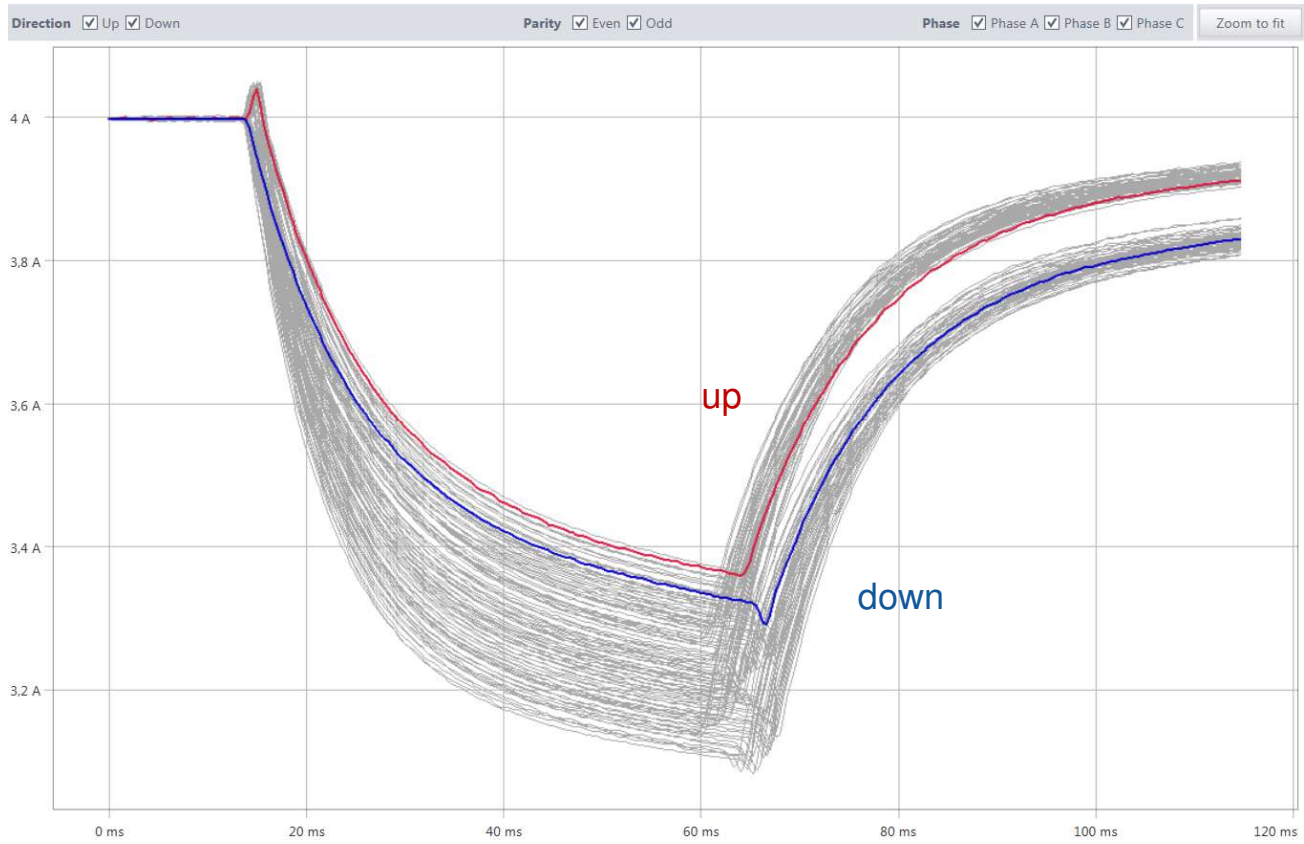
■ UP (1 -> 2): decreasing number of turns ■ DOWN (2->1): increasing number of turns

Impact of test current magnitude



■ before and ■ after maintenance

Influence of Direction



Conclusion

- Dynamic Resistance Measurement supplemental method to diagnose resistive type tap changers
- Record current or resistance signature during switching operation
- Beware of influencing factors like design, test current magnitude and short circuit on secondary side

Thank you for your attention...

Questions?