ArmCoil

*Delivering Power Solutions through Transformers & Substations*

# CASE STUDY

ArmCoils' Retrofit Design for FORD Manufacturing Plant

PREPARED BY CHANTEL MIDDLEDITCH

2023

# INTRODUCTION:

In 2019, FORD Manufacturing Plant's Silverton facility encountered significant challenges related to a 1.8MVA Dry Type ANAF Transformer. The original design of the transformer allowed moisture to permeate the system, leading to elevated operational temperatures of up to 142 degrees Celsius. The inefficiencies resulting from these issues necessitated a proactive intervention to rectify the design flaws and improve the transformer's overall performance. This case study highlights the transformative impact of ArmCoils' retrofit design in mitigating moisture ingress, optimizing temperature regulation, and ensuring the robust functionality of the transformer at the FORD Manufacturing Plant.

# CHALLENGES FACED:

The initial transformer design exhibited a critical vulnerability to moisture ingress, which not only compromised the insulation system but also contributed to the substantial elevation of operating temperatures, posing a severe threat to the transformer's efficiency and longevity. This necessitated an urgent intervention to address the issues and enhance the operational performance of the transformer, while also ensuring its compliance with stringent safety and quality standards.

# ARMCOILS' RETROFIT SOLUTION:

ArmCoils, renowned for its expertise in transformer retrofitting and advanced engineering solutions, proposed a comprehensive redesign plan to revamp the existing transformer system at the FORD Manufacturing Plant. The proposed solution aimed to eliminate the moisture-related issues and regulate the operating temperatures within the optimal range to ensure enhanced efficiency and extended service life. ArmCoils implemented the following key modifications:

- **Fans:** ArmCoils incorporated advanced fan systems strategically positioned within the transformer to facilitate efficient heat dissipation and maintain optimal operating temperatures. This feature enabled the effective mitigation of the heat generated during operation, preventing the recurrence of high-temperature issues.
- **Heaters:** To counter the moisture ingress and condensation, ArmCoils integrated customized heaters within the system, ensuring a controlled environment that prevented the formation of moisture and condensation. These heaters functioned seamlessly to maintain the ideal temperature within the transformer, safeguarding its insulation and core components.
- **Breather:** ArmCoils installed a specially designed breather to regulate the air exchange within the transformer, preventing the entry of moisture and contaminants while allowing the controlled flow of air. This mechanism significantly enhanced the transformer's resilience to environmental factors, minimizing the risk of moisture-induced damage and optimizing its operational performance.

# OUTCOME AND BENEFITS:

The robust retrofit design implemented by ArmCoils yielded remarkable improvements in the transformer's performance and longevity. The successful integration of fans, heaters, and a breather effectively curtailed moisture ingress, thereby mitigating the risks associated with insulation degradation and high operating temperatures. As a result, the current operational temperatures of the transformer now remain stable within the range of 40-50 degrees Celsius, signifying a substantial enhancement in operational efficiency and reliability.

Furthermore, the retrofit design ensured compliance with the industry's stringent quality standards and safety regulations, positioning the FORD Manufacturing Plant's transformer system as a reliable and sustainable component of their operational infrastructure. ArmCoils' innovative solution not only resolved the immediate operational challenges but also paved the way for improved resilience and long-term performance sustainability for the transformer, thus underlining the significance of proactive engineering interventions in enhancing industrial infrastructure's efficiency and reliability.

# CONCLUSION:

The successful collaboration between FORD Manufacturing Plant and ArmCoils exemplifies the pivotal role of innovative engineering solutions in addressing critical operational challenges within industrial infrastructure. The retrofit design's transformative impact, eliminating moisture ingress and regulating operational temperatures, has positioned the transformer system for sustained performance and longevity. This case study underscores the significance of proactive interventions and technological advancements in ensuring the resilience and efficiency of critical industrial equipment, serving as a testament to ArmCoils' commitment to delivering cutting-edge engineering solutions for complex operational challenges.

# THANK YOU!

Let us guide you towards your own success story. Reach out to us today and embark on a path towards exceptional results.

ArmCoil

*Delivering Power Solutions through Transformers & Substations*

## CONTACT

SALES@ARMCOIL.CO.ZA
+27 11 763 2351
HTTPS://LINKTR.EE/ARMCOIL