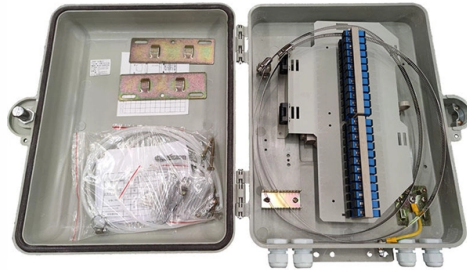


Testing with a relay protection tester in Kazakhstan



Overview

Digital and numerical protection relays will have a self-test procedure that is presented in the relay manual.

Key Takeaways

Relay protection testing in Kazakhstan can be effectively conducted using advanced test sets like OMICRON CMC Family, with hands-on training available at OMICRON Academy in Aktogay. Overview of Relay Protection Testing

Relay protection testing ensures that protection relays and associated equipment operate correctly to safeguard power systems, prevent equipment damage, and maintain grid stability. Testing typically involves:

- Primary and secondary injection tests to simulate fault conditions.
- Functional verification of relay settings and coordination.
- Circuit-breaker diagnostics to ensure proper operation under load and fault conditions.
- System-level testing to validate the entire protection scheme.

Equipment and Tools

In Kazakhstan, commonly used relay protection testers include:

- OMICRON CMC Family: Modular, multi-phase test sets for primary and secondary injection, capable of testing electromechanical, static, and digital relays .
- Test Universe Software: For automated testing, result analysis, and report generation.
- CIBANO 500: Circuit-breaker diagnostic tool.
- COMPANO 100: For primary and secondary equipment testing.
- CPC 100: Substation commissioning tool . Accessories like LLX1 allow testing of relays with sensor inputs, simulating voltage dividers, Rogowski coils, or low-power current transformers .

Testing Procedures

- Preparation: Verify relay configuration, wiring, and environmental conditions.
- Functional Tests: Apply simulated fault currents and voltages to check relay response.
- Calibration and Verification: Ensure relay settings match design specifications.
- System Testing: Test the complete protection scheme under simulated fault scenarios to confirm coordination and reliability .
- Documentation: Record results for compliance, maintenance, and troubleshooting purposes.

Training Opportunities in Kazakhstan

Hands-on training is available at OMICRON Academy in Aktogay, covering:

- Relay protection testing with CMC Family and Test Universe.
- Circuit-breaker diagnostics with CIBANO 500.
- Substation commissioning with CPC 100.
- Primary and secondary equipment testing with COMPANO 100 . Such training strengthens practical skills and ensures engineers can perform reliable protection testing and diagnostics in real-world power systems.

Best Practices

- Always follow IEC 61850 standards for digital substation communication.
- Use flexible test sets capable of handling multiple relay types and outputs.
- Conduct regular testing to detect faults early and maintain system reliability.
- Document all test results for future reference and compliance. By combining modern testing equipment, standardized procedures, and professional training, engineers in Kazakhstan can ensure safe, reliable, and efficient operation of power system protection relays.

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