Static Relays and Meters

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In recent years, we have seen a decided trend toward the use of metering and protective devices using solid-state components, particularly microprocessor-based digital devices. These devices are often used instead of the conventional electro-mechanical relays or analog meters. While we have no formal statistics, looking at the equipment manufactured by Powell I estimate that static devices are used for about 40-50% of the relays and meters we provide to our customers.

Some of the reasons for this shift to static devices include:

- In general, static devices are more accurate and more repeatable than the equivalent electro-mechanical devices.
- A single static device can perform the functions of many electro-mechanical devices.
- Equivalent functions can often be obtained at lower cost, particularly if a multi-function device is used.
- Some functions or operating characteristics which are not possible with available electro-mechanical devices can be done with static devices.
- Static devices can be provided with communications capability which is not available in electro-mechanical devices.
- Static devices can be made highly resistant to corrosive or dirty atmospheres.

However, not every engineer is happy with the idea of relying on static devices for protection functions. Some of the reasons are:

- Possibility of total failure of the protective system due to failure of one component on the critical path, such as a common power supply.
- Long-term familiarity and satisfactory experience with electro-mechanical devices.
- Lack of service capabilities for static devices.
- Existing company standards.
- Concerns about possible failure in adverse environments, both physical and electrical.
As time goes on, many of the shortcomings of static devices available 10 or more years ago have been overcome by further development of solid-state components and better packaging. New static products are arriving in the marketplace with great regularity, and their capabilities are constantly being expanded. On the other hand, little if any development work is being done on electro-mechanical relays and meters. Long-term, I expect that the balance between static and electro-mechanical devices will shift to 90-95% static. I would expect this to happen in about the next 10 years, but don't hold me to the timing.

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