



The Socratic Method of Testing

The testing of protection relays is the main subject of this issue and we are lucky to have several very interesting articles that cover a wide range of issues related to it. **As in many other cases, when we talk about something, we need to start with a definition.**

IF WE DO A SEARCH ON THE INTERNET, we will see different versions of a “testing” definition. More or less, they can be summarized as: A procedure for critical evaluation; a means of determining the presence, quality, or truth of something.

If we analyze this definition, we can see that there are several aspects that are valid for any abstract type of testing and can be applied as well to the field of protection, automation and control of electric power systems.

First of all, we need to note that we are talking about critical evaluation. This should be a process of systematic collection and analysis of data that can help us make a decision regarding the use of a specific device for a specific application. It is intended to determine not only what is the deviation of the technical characteristics of the tested object from its specification, but also how critical the differences are to the use of the device for the application.

Determining the presence and true quality of the functionality described by the specification requires sufficient amount of high quality data. Considering the fact that protection functions operate in case of events that have a very low probability and duration in the tens of milliseconds, it is obvious that we need to evaluate the device of interest by actively exposing it to the

different normal and abnormal conditions that may exist in the electric power system.

The continuous improvements of the hardware and software used for protection, automation and control devices, as well as the wide spread use of high-speed peer-to-peer communication messages for distributed applications create an environment that requires a new look at the methods and tools that are used for testing. Like with many other things, the problems that we face as an industry are not unique and we can learn a lot not only from other domains, but also from the wise men in the past. Especially when we have to break with the traditions of the past, when we have to think in order to move forward. This is when the use of the Socratic Method can help.

Its main purpose is to prepare people to think. The problem usually is not the ability of a person to think, but the state of mind of knowing all the answers, of knowing that we do something in a certain way because that is how we have always done it. The Socratic goal can be described as the improvement of a human being through increased understanding by deconstructing the person’s previous beliefs and leaving them with the experience of being less sure of what they previously knew with greater certainty.

Following well established procedures that have worked well in the past can be very helpful, because they give us a sense of stability and reduce the required efforts. At the same time it can be dangerous, since it may decrease our ability to observe our environment and detect the need to adapt to the changes around us.

The benefits from using the Socratic Method of questioning that explores the implications of others’ positions are that it stimulates rational thinking and illuminates ideas that can help us do everything in our lives better.

Going back to the issue of testing of advanced protection relays and complex distributed protection, automation and control systems, we need to start asking the questions that will help us determine if the methods and tools that we have been using in the twentieth century can still give us the comfort of knowing that the devices and systems that we put in service will operate as designed. The answers to our questions should lead us to the use of the right tools for the task in front of us, so that when it is necessary we will use a test device that produces more than 100 A of current to operate an electromechanical ground overcurrent relay or generate the voltages and currents, as well as the IEC 61850 9-2 sampled values and GOOSE messages for the testing of advanced protection functions.

As for me, all I know is that I know nothing.

Socrates
(469 – 399 BC)