



Do we have Guts?

In the power industry we have developed **rules of thumb** based on many years of operational experience, research and debate.

One of the best known examples of such a rule is the “N-1” criterion that defines that one element can fail without affecting the overall performance of the system.

With the introduction of various new solutions and technologies such as CIM, IEC 61850, XML, etc our industry is currently going through a step change process. But somehow I get the impression that many engineers have not grasped the impact of these new possibilities. What leads me to this conclusion is the debate that I witnessed recently between engineers at a large conference on main and back up protection schemes. A solution was presented to protect our high voltage systems making full use of the technology available and therefore eliminating the Main 2 or back up protection. Such solution leads to a fundamentally different approach than the traditional one of putting boxes in parallel whilst guaranteeing a system equally reliable as the traditional ones. This led to a fierce debate in which many engineers stated that eliminating the Main 2 protection is unacceptable because of the “N-1” criterion. But is this really a true statement? Does N-1 simply always apply? The discussion shows in my opinion two things. We have not yet embraced the possibilities that new technologies bring and more important, do our “rules of thumb” still apply?

Are you wondering why? I will illustrate this using an example from the time when I started my career. As a protection engineer I was



given the task to work out a solution for the protection of a teed off feeder. I researched the topic and proposed a scheme in which a three legged line differential scheme was used in combination with a back up distance protection. When I presented this solution to my senior protection engineers, it was dismissed with the following comment: “protection shall never rely on communication as long as we are in charge”. As we all know, differential relays are currently in use worldwide and have been proven to provide a reliable and selective protection solution. The example shows in my opinion that dismissing ideas simply because they do not fit in our current way of thinking is a mistake. Just because we cannot yet grasp all the effects of a proposed solution does not mean it is wrong.

I often ask myself how we can evaluate solutions that are being developed by engineers that make use of new technologies. Can we go that using our traditional rules

of thumb or should we dare to reconsider these principles? For some people the mere suggestion of questioning the very foundations of our industry is seen as blasphemy, but is it? Is it valid to use rules that have been around for decades to judge whether new solutions fulfill our requirements of today? We should remember that these rules are based on information available at the moment they were defined. How applicable is a rule that was defined in an age when relay technology was electro-mechanic, power systems were static, utilities were vertically integrated, energy markets did not exist, engineering capability was not scarce, business drivers were not the focus, etc.? Why is it that the engineering community clings on to practices that have been defined often without knowing the reason they were developed? Why have we stopped questioning whether we do things for the right reasons, based on the right starting points, trying to achieve the right goals? I know that we have a solid engineering basis with rules of thumb that we use every day to define our solutions that have proven that they work and lead to sound solutions and I am not suggesting we should simply dismiss these practices today. However I do believe that whilst going through a technology step change it is also time to have the guts to evaluate the very basis of our engineering practices today to re-affirm the ones that are still valid and to renew the ones that have become obsolete.

Biography

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