



## Using experience to innovate

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WHEN I STARTED MY CAREER, just like many young engineers, I was full of plans and ideas to improve the world and make the Power Industry better, more efficient and innovative. Just like many young engineers today I was surrounded by experienced engineers that could not resist telling me great stories about everything that went or that could go wrong. The stories were indeed great and they inspired me to look for ways to avoid the problems they described and to improve the ways we did things. However in many cases I found that the experienced engineers created roadblocks for my innovative ideas and that many of them were afraid of innovation and more so, the associated change.

Now that I am in my forties, and can consider myself a member of the experienced engineers, I wonder why it is that people so often seem to become more afraid of change, innovation and new ideas when they become older. Maybe it is because of the difference between knowledge and experience. When I was still an intern my first mentor at the utility asked me that question once. The answer is actually quite simple. Knowledge is knowing what is possible and experience is knowing what is impossible. I think that within this



explanation lies the answer to the question why experienced people are in general more afraid of change and new ideas.

So should we get rid of experienced people if we want to innovate our industry, change the paradigm and improve its performance? I believe that the answer to this is obvious... No! I think we need to approach it from a different angle. On one side we need experience to avoid making the same mistakes others have made before us, but at the same time we need the drive to improve the world from the younger generation.

So how do we achieve this? I think we need to look at our traditional behavior as power system engineers. In many cases seasoned engineers base their judgments solely on their experience. In al-

most as many cases however this leads them to dismissing new ideas just because they are new and go beyond the level of experience of the person evaluating them. I experienced this myself when after months of study and calculation I presented a solution for the protection of a teed feeder using a line differential protection with a backup distance protection. This in itself was nothing new, but it was the first time the utility would be using a line differential protection at that time. When I gave my senior the proposal he looked at me and said “*over my dead body will protection ever rely on communication*”. He did not even read my proposal and put it on his pile of rejected proposals. Why? In his experience line differential protection had too many unknowns and therefore would lead to power system problems because he believed the technology was not mature. If he had only taken the time to read my research and the resulting proposal he would have seen that I had tried to answer all of his concerns and proposed a well proven and working solution, which of course is now common place...

But this is not the only issue we must address. We also need to look at the way the younger generation uses its knowledge to gener-

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ate and present new ideas. I often find that young engineers are not stimulated nor trained to present their ideas in a concise, structured manner, speaking the language the experienced engineers and the managers need to hear. This leads to misinterpretation of what is being proposed and dismissal of many good and innovative ideas. It is in my opinion the responsibility of the more experienced engineers to show how to do it, what goes into a good report and take up a role of mentoring, showing how they presented ideas and got approval in the past. The next time a young engineer walks into our office with a whacky idea, we should consider how we will actually go about encouraging him or her to think about it again. It may help to imagine what you could do differently if a junior walks into your of-

ing computer geeks with all things IP, but they in many cases know what things have to do, and perhaps even more important - what they shouldn't do...

So in my opinion the younger generation of engineers needs to consider that one day they will become experienced engineers themselves and should try to learn from the experience of their senior peers instead of dismissing them as old fashioned.

It then is up to the experienced engineers to challenge the young engineers with the thought – if only I could find a new way to do... The young generation needs to realize that neither IEC 61850 nor Smart Grid was born out of some graduate walking out of university and saying “I know, I think I will...”. It came from the experienced minds being able to enunciate their own

Experienced engineers should try to give new ideas a chance and evaluate them not only based on their own experience, but judge these ideas based on the benefits they bring, the evolution they initiate and most important their innovative nature.

The younger generation in return has to realize that experience is real. It is based on actual situations.

When presenting innovative ideas the young engineer should keep in mind that the hurdle of experience, good and bad, has to be overcome for the proposal to be accepted and implemented. At the same time the young engineer needs to have a perspective beyond the technology. Imagine a graduate coming to a senior engineer saying I have a new circuit breaker using nanotechnology. I can just imagine that the senior engineer would say “brilliant – that is just what I’ve wanted someone to walk in and say and the Board & I were just lamenting that we needed nanotechnology to return a better investment to the shareholder”.

Knowing the business context, not just an (individual) technology, is what it is about.

With the discussion about Smart Grids we have entered in an era where new innovative ideas are needed to create the agile, flexible, cost effective, responsive power grids we desire.

This means that we can no longer rely on experience alone but we need new people to step up to the plate and present evolutionary and even revolutionary ideas. At the same time we, the power system engineers, need to open our minds and listen, learn and enjoy the chances we are given to make our industry better by using the available experience to avoid mistakes and using the available knowledge and drive to innovate our industry.

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office with a revolutionary proposal in hand. After all, time is precious and if you have a choice between finishing the report to the senior executive in the next five minutes or reading this cockamamie idea, what would you do?

There is another side to the medal as well. As an experienced engineer I sometimes witness a lack of respect for the older generation. There seems to be an attitude that the ‘old guys’ didn’t do anything novel or way out there with technology – that a relay of the 1950’s was not soul searching innovation, that a step to a BC107 transistor and a 1N4007 diode wasn’t excruciatingly painful and risky, that putting a microprocessor into protection in a substation wasn’t “out with the old thinking”. Today the older engineers may not be practic-

difficulties to solve the next biggest problem and challenging others to find a solution beyond what the previous technology provided.

This is where using experience to leverage innovation comes into play. There will be a time when someone says “I can’t do this with IEC 61850 or Smart Grid, we need a new widget that does ...” One word of caution though. I wonder if the current generation of young engineers realizes that one day a young gun will be so glad that the organization has corralled them into a corner as the old guard who has been hindering the organization development. There will be a day when a young gun will say “Smart Grid? – ha! wasn’t he thinking?”

So what do we need to do? I think the answer is as simple as the question itself.