

## Issues and challenges in examining software document

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In my opinion, software document should as a sufficient evidence supports that the software design and construction of the meter complies with the requirements of relevant recommendation. It may describe some software meanings or solutions to guarantee minimum or impossible misuse and fraud. In fact we needn't pay attention document format or document quality. Although good document quality means good solutions.

Based on my work background, I'll talk about the issues and challenges in examining software document as an energy meter type evaluation engineer.

First it is about the engineer's technical background and experience.

In china, the program of pattern evaluation JJF 1245(adopted R46) for energy meter has established document requirements and document checklist. However, as an examiner, we'll still encounter situations that are not specified in the program. So it is important that the examiner should have the technical background and experience to infer its compliance from the solution in the applicant's document. But software validation is a new part in type evaluation. Few examiners have practiced and accumulated extensive working experience in this area. The applicant's technical document is written from a product development perspective, focusing on functional requirements and solutions. It usually doesn't give direct evidence and reasoning in the document which can come to the conclusion. During examining document, we often see that examiner keep asking how the developer considers protection of metrological characteristic, such as fraud and misuse, and the developer explaining why the solution is guaranteed to conform to the relevant recommendation. Because there is no document that can exhaustively list all acceptable and unacceptable solutions. Examiner and developer always need to agree on whether the solution meets the requirements of the relevant

recommendation. Technology is always developing, and new solutions will be adopted. Examiners need to continuously learn and accumulate relevant knowledge and experience. Despite the challenges, as long as we continue to do this work, it will also become smoother.

The second is about the understanding deviation between examiners for requirements of relevant recommendation.

For example, Let's see a requirement from clause 3.6.4.3 in page 24 of R46, it described that "3.6.4.3 When modifying a device-specific parameter, the meter shall stop registering energy." . The applicant creates a solution for modifying a device-specific parameter that won't stop registering energy and won't cause any registering energy value or other data conflict or mistake. In this situation, the examiner needs to infer its compliance or not from the solution. And different examiner maybe has different opinion and cause completely opposite conclusion. But this understanding deviation between examiners is something we need to avoid.

Although there are issues and challenges of one kind or another in examining software document for type evaluation engineer, such as lack of practice and experience, Inconsistent understanding of requirements or acceptable solutions etc. But I believe as long as we continue to overcome these issues and challenges. In the end it wouldn't be a problem. In fact I found this online workshop is a good platform to enhance knowledge and eliminate understanding bias on software validation. So it is my pleasure to participate in this online workshop.