

Can a Technician Get an Even Break?

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The following article is an attempt to address real problems encountered by a technician trying to pass the NARTE EMC certification examination. NARTE recognizes technician as a distinct craft separate and



apart from engineering. Technicians bring a wealth of practical experience and detailed knowledge of shop practice not taught to engineers. As it says on the reference form in the EMC application, "In a nutshell engineers know the math and the physics of EMC. Technicians know the instruments and the test setups. Technicians need to know the pitfalls of real measurements." While the

EMC certification process holds technicians responsible for specific areas of technology, it is understood that technicians can be held responsible for concepts as well.

A Real Example

Comes now our technician friend¹. He spent about nine straight days at six hours a day studying for his exam. He used the information listed on the NARTE website and was very confident he would pass the exam. He was shocked when he found out he had not passed. He did not miss by much but he had to ask why. Had he not done the right things?

Here are some questions or issues that arose from taking the test:

a. In some of the study materials he used, a question (which did appear on the examination) was clas-

sified in that study guide as an engineering question. Because it was tagged as engineer, he felt he could avoid it.

b. Also, all antennas and printed circuit board questions in the study guide he used are classified as engineering questions. He felt that since the book is a book that NARTE recommends, it is kind of misleading because technicians would tend to ignore the questions that are labeled for engineers if you were preparing for the technician exam.

c. He then asked around to people who have attempted the NARTE technician exam in the past about printed circuit board design questions and none of them seem to remember having these type questions on their test. From a technician standpoint design would be something an engineer does. They may ask you to put the board together but not to design it.

"I understand we should know the concepts, but the point I am trying to make is that the exam subjects do not specifically identify printed circuit board design or layouts. When you sit down to get familiar with the material, this is not one of the things you would give too much attention to." He had followed the NARTE website recommendations and still fell short by a few steps. At this point he hated to think that all the time he spent studying was a waste because he was not studying the right stuff.

A Technician's Life

Parts of this technician's problems come from his own past experience and part from how he approached the examination. Let's first look at his past experience.

There is no consistent training process for technicians. There is some classroom instruction to gain command of the basics (usually a vocational electronics course, perhaps augmented with some specialization at the end) and a lot of "on-the-job" training to learn test setups, instrumentation or perhaps modeling. Some shops line up technicians to specific, repetitive procedures. They get very good at running specific tests or calibrations but not much exposure to other aspects of the business.

Other shops line up the technician to a client and

expect him or her to support any or every test that the client needs. This approach broadens the individual technician but is not as efficient for the shop. In a competitive environment lower efficiency may not be acceptable, especially if not offset by service to the customer.

In some specialty organizations, the technician may well be the “doer” for an engineer developing new equipment. The engineer lays out the concept and the technician fabricates the end device. This is a great team environment for growth. Unfortunately these opportunities are very rare and generally populated by very senior technicians.

There is yet another group of technicians best described as engineering technicians. These practitioners are former craft people who understand what their craft does. They are taken into the engineering group to provide manufacturing, assembly or test insight to augment the engineering staff. They will generally perform paraprofessional tasks and may invoke specifications, create drawings or develop engineering changes.

Our technician works in the automotive industry. “As an automotive EMC technician about 90% of the questions on the test do not pertain to my job or what I do on a daily basis.” Clearly, it will be more challenging to our technician to make up for lost exposure through study but there really is no other way. We could cavalierly suggest that he change jobs to get greater exposure, but that would take time and still not guarantee that he will get the right exposure to be able to pass the test. Remember that the purpose of the examination is to let the candidate show his or her command of the technology, not the limitations of their work experience.

Getting to the Task

Now let’s examine his approach to the examination. There is no substitute for study and drill. Study is the exploration of technology concepts beyond one’s current knowledge base. That is why the test is open book. If one knows his reference materials and the underlying mathematics, then the challenge of unfamiliar technology can be overcome.

When he started his review preparation he did a smart thing. He obtained books of problems and spent time drilling. Drill is the repetitive working of problems to increase the examinee’s ability to attack and com-

plete a large number of questions in a defined period of time. He spent 54 hours drilling and reviewing. Is that enough? It all depends on how long it has been since he took a comprehensive examination and how well he knows the reference materials he has chosen. If he has too many references, he risks losing time doing research during the examination. If he is not quick with figures or rusty on mathematical manipulations, he may need to drill more. These are personal characteristics that only an individual can answer for themselves.

He was given a test booklet with 48 questions in it labeled as a test for EMC technicians. He must assume then that every question in it has been judged by someone to be at a technician level. The question at this point is not if a question is valid for a technician but can he successfully answer the question. He was told that NARTE would only score the first 40 questions it encountered on his answer sheet. That meant he had to discard eight questions off the top. He should at this point carefully select which eight that should be.

Of the remaining 40 questions he needs to only get 70% correct (or 28 questions). He does not get any more credit for correctly answering more than 28 questions. Passing is passing – period. Thus up to 12 more questions can be discarded (or at least their importance downgraded). Questions in this category of the 12 he is not sure of should be carefully selected as well. Remaining should be 28 questions in which he is supremely confident.

If he is not that confident of the 28 questions selected, maybe that is a sign that there is a problem. Maybe he did not study the right things. Or maybe he just got a set of questions that was bad for him. At this point it is important to remember that there is no stigma in NARTE’s eyes for not passing the examination. Sometimes it is just good to sit for the exam to see what is on it, gain confidence and turn the next sitting into a “slam dunk”.

NARTE generates a new examination every 90 days so the probability of his seeing the same set of questions is slim. He may see some but not all. That is a good thing. His next opportunity to pass the examination may have questions that are more closely related to his experience. The actual questions on any examination are all a matter of chance.

Back to our original question: can a technician get an even break? There are certainly no gifts in the

process. As we have shown, there are ways to improve a technician's probability of passing the examination. The examination is not a trivial exercise, but the more a person knows about the structure and philosophy of the examination, the better his or her chances of passing will be. In the end, it is not a matter of breaks. A technician will make his or her own breaks.

1. These experiences came from an interview by me of a practicing EMC technician. I wanted to list him as a co-author but his management did not want him or the company listed as contributors. Some companies are just that way. I, as an author, must honor their wishes. However, I freely admit that this article would not have happened without the technician's help for which I am ever grateful.

New NARTE News Editor

Tom Chesworth, PhD, PE, NCE has agreed to assume responsibility as technical editor of *NARTE News*. Dr. Chesworth, W3IA, is president of Seven Mountains Scientific Inc. in Boalsburg, Pennsylvania, publisher of *Electromagnetic News Report*, *Advanced Fuel Cell Technology*, and *Advanced Battery Technology*.



Tom Chesworth

He succeeds Kent Mills who had been editor of the News since 1988. Kent was instrumental in reformatting the news and enhancing the overall quality as well as digging out technical articles of general interest. While he refers to the News as a "labor of love," he is no longer able to continue in that capacity. Kent retired (for the second time) last year and really wants to spend time with his family. He set a high standard of excellence with his dogged devotion to quality and broad technical interests.

Dr. Chesworth has been a NARTE-certified EMC engineer since 1989. He has been a board member and is an active member of the IEEE EMC Society. He taught physics and worked at the Ionosphere Research Laboratory and the Radio Astronomy Laboratory at The Pennsylvania State University. He

also worked in EMC and ECM at HRB-Singer and Locus Inc. in State College, Pennsylvania. He is a strong supporter of NARTE certification.

The trade journals, which he now publishes, are targeted to a variety of narrow technical fields. They are very similar in structure to the *NARTE News*, all of which makes him an excellent person to assume editorial responsibility.

Welcome aboard, Tom.

Recognizing Excellence

NARTE "Heptode" Awards

The NARTE "Heptode Award" is granted by NARTE headquarters staff to properly recognize those who lighten their burden or who otherwise represent NARTE in an outstanding manner. Congratu-



Heptode awards went to AARL's Maria Summa, David Sumner, and Bob Inderbitzen (right) from NARTE's Terri Marinucci.

lations to the following summer 2005 Heptode recipients, Bob Inderbitzen and the American Radio Relay League (ARRL).

On June 21, Terri and Melissa visited ARRL Headquarters in Newington, Connecticut, to present a Heptode Award to Bob Inderbitzen and ARRL for their help in making NARTE's attendance at the Dayton Hamvention a success. NARTE conducted FCC examinations at the Hamvention. This was a first-time event for NARTE although the Hamvention has been going on for more than 20 years.