

Experience with an International NDT Master Course in View of Research and Development

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Engineering products are generally designed such that they meet the requirements set. This is achieved through good engineering practise added by safety factors when a lack of knowledge and hence uncertainties do exist. NDT in that regard has traditionally been used as a technology to confirm the quality of such engineering products. As such NDT is a topic mainly addressed towards the end of a product's process chain would it be related to design or even manufacturing. In aviation NDT has obtained its firm role to guarantee the damage tolerance principle, which is a major building block in aviation's lightweight design. However, NDT has recently also been increasingly recognised as an instrument to validate an ageing infrastructure's condition being a major element in assessing an infrastructure's residual operational life. Finally, NDT is a science which acts between physics, applied mathematics, and information science on the one side and the broad spectrum of engineering including civil, computation, electrical, mechanical, process and possibly much more on the other. NDT has therefore deserved a much more important role to be taken in the future address-ing an engineering product's complete life cycle starting from aspects of 'design for insec-tability' and ending by 'sorting for recycling'. Such a challenge requires the education and training of a next generation of NDT experts on an academically high level, having to go far beyond technical training mainly performed nowadays. Dresden International University (DIU) has been running a two years master course specifically devoted to NDT since 2013 where an increasing number of applicants from various places around the world have joined in the meantime. The course is organised in four semesters and has a strong scientific and hence research focus. In the first semester students are taught in all the major fundamental disciplines such as materials (metals, polymers, composites), measurement techniques, mechanics (vibration, sound, fatigue, fracture), nu-merical methods and signal processing, and introduction to NDT & quality management. In the second semester major emphasis is on the different NDT techniques including acoustics, optics, electromagnetism, radiology and microscopy. The third semester is devoted to partic-ipating in the Basic Course (BC) of the German Society for NDT (DGZfP) which the students have to pass and then further allow them to go directly for a Level III after a respective peri-od of professional experience to follow. A research placement then follows in reputable research centres in Germany such as BAM in Berlin, Fraunhofer, industries or different univer-sities. Recently those activities have also spread to countries abroad such as Switzerland, Poland or Italy, all with a specific dedication to NDT. During the fourth and final semester students do perform their master thesis, most likely with the institutions they already per-formed their research placement with. With the third semester students move to Ber-lin/Germany for the BC module at DGZFP before transferring to the location where they will perform their research placement most likely followed by the master thesis. The motivation to run such a course is various. It starts from recruiting students globally to get them familiarized to what NDT means from a German quality point of view. It further allows a mixture of young people with different cultural backgrounds to come together to share their views on quality and standards, being an important aspect in terms understand-ing engineering on an international basis. Finally NDT needs people with an academic back-ground founded out of NDT itself that will allow people with a responsibility in engineering to also think 'out of the box', would it be going out or getting into NDT itself. This also needs to educate people with potential skills for a career in academic as well as applied industrial research. In that regard DIU has now graduated around 50 students who have found their way into challenging research but also industrial positions. The presentation will first de-scribe the course in its basic structure before going into some of the relevant specifics, which have been learnt and implemented over the past years such as collaborations with partner institutions in academia and industry and what further mutual benefits could be developed out of this. The ideas realised and presented will not be described on a theoretical basis only but will be rather also underlined by practical cases of graduating individuals moving into their professional life.