Syllabus for the future of NDT Integrity Engineer

Peter Trampus[1]

[1]-, Academia NDT International, Hungary

NDT related high education is among the highest priorities of Academia NDT International. Having recognized that NDT competence is increasingly needed to respond to technological development in ensuring long term integrity of components and structures of ageing assets, a new profession – NDT Integrity Engineer – and, logically, a new university discipline was developed. NDT integrity engineering is a profession to develop non-destructive testing and evaluation involving materials science, fracture mechanics, and other sciences that would guarantee the safety and reliability. The presentation introduces the syllabus enables to achieve needed competences of NDT Integrity Engineer. The overall basis is a clear understanding of NDT, what are the possibilities and limitations of NDT, and how can it serve the structural integrity related decisions. The syllabus has the three pillars of structural integrity assessment: NDT, materials and loading / environment. NDT related core knowledge includes the physical bases of the major methods; the application areas and the limitations; the elements of NDT reliability; the tendency to provide early detection of materials degradation; the structural health monitoring strategies and techniques; the impact of progress in information technology and electronics; the role of modelling and simulation; the NDT system qualification; and related issues. The materials science related knowledge includes the fundamental manufacturing processes; the potential failures associated with manufacturing; the mechanical properties of usual structural materials; the microstructural characterization; the materials ageing processes and their effect on component integrity, including possible synergy of degradation processes. The loading and environmental condition related knowledge covers the awareness of the physical fields arising in the component during operation; the basics of analytical and numerical methods of their calculations; the consequences of the materials degradation processes; the basics of fracture mechanics.