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Dr. Don Palmer has 32 years of experience at Boeing in the areas of nondestructive evaluation (NDE), measurement technology and process control. He provided production and/or in-service NDE support on a wide variety of military, commercial and space programs. Don has also led both manufacturing and in-service support applications of NDE. These efforts led to a number of key technology advancements applied to composite structures and support of aging aircraft. He currently leads Boeing enterprise-wide teams on advanced sensors for NDE applications and NDE for additive manufacturing. Don received his B.S. degree in physics and his M.S. degree in materials science and

engineering from Iowa State University. He also received a doctorate in materials science and engineering from Washington University in St. Louis. Don was elected to the Boeing Technical Fellowship as an Associate Fellow in 2001 and Fellow in 2005. In 2010, he was elected a Fellow of the American Society for Nondestructive Testing. Don holds 10 patents and has over 50 publications in technical journals and conference proceedings.

Title: NDE in Aerospace: The Engineering Evolution

Abstract:

Nondestructive evaluation (NDE) has played a role in the aerospace industry since its earliest stages. The importance of NDE relative to manufacturing and support of aerospace systems has increased significantly since the days of “sticks and canvas”. As a result, NDE has moved from a set of simple quality assurance processes to a critical engineering technology. Whether the design philosophy was safe-life or damage tolerant, NDE has formed integral parts of both manufacturing and in-service support strategies. From the manufacturing perspective, introduction of new materials and manufacturing processes have often resulted in a new generation of NDE technology necessary to support generation of design allowables as well as structural complexities brought about by advanced manufacturing. From the in-service support perspective, many aircraft are flying well beyond their design lives, generating aging and fatigue conditions never imagined during the design process. A number of catastrophic events over the past 30+ years have led to the development more quantitative

NDE tools to support aircraft maintenance and life extension initiatives. The evolution of NDE as an engineering discipline, specifically as it relates to the aerospace industry, will be discussed. This will include perspectives on the past, present and future of the technology.