

# Systems Engineering

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The term “systems engineering”, when entered into the Google search page, produces a significant number of results, evidence that systems engineering is recognized as being important for the success of essentially all products. Since most readers of this item will be rather well versed in documents concerning systems engineering, I have elected to share some of the points made on this subject in a document developed by the European Cooperation for Space Standardization (ECSS), a component of the European Space Agency (Anon 2009).

The ECSS document defines systems engineering as “an interdisciplinary approach governing the total technical effort to transform requirements into a system solution”. These requirements include hardware, software, firmware, human resources, information, techniques, facilities, services, and other support elements. The systems engineering process is intrinsically iterative across the whole life cycle of the project and is produced under the leadership of engineering talents with technical excellence attributes. Systems engineering is not an administrative focused or led function. Technical excellence is the key to successful systems engineering and, thus, to a successful project.

An article that addressed new synergies between systems engineering and diminishment of manufacturing sources and material shortages made two important points (Bracuto et al. 2010):

(a) systems engineering principles and best practices should be applied to enhance reliability, availability, maintainability, and sustainability through the entire life of a program; (b) managing major programs effectively requires sound systems engineering. Accordingly, technical excellence and the associated “tall poles” (Dannenberg 1974) – (a) Pay attention to details; (b) Leave no stone unturned; and (c) Be aggressive – not passive – are integral to ensure the applications of the principals and best practices of systems engineering to aerospace programs, as well as to other programs, achieving the intended goals.

## REFERENCES

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Dannenberg KK (1974) Management philosophies as applied to major NASA programs. NASA-CR-141258. Washington, DC: National Aeronautics and Space Administration.

NOTE: This editorial is based on “Technical Excellence: A Requirement for Good Engineering” (AIAA-2008-1120), prepared and presented by the author at the 47th American Institute of Aeronautics and Astronautics Aerospace Sciences Meeting, January 7-11, 2008, Reno, NV, USA.

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