INCOSE Spotlight on Heinz Stoewer
Interviewed by Sandy Young, info@incose.org

Name: Heinz Stoewer
Titles/Organizations: President at Space Associates GmbH, advisor at Airbus, chair emeritus for systems engineering at Delft University of Technology and "Distinguished Visiting Scientist" NASA Jet Propulsion Laboratory

Place of Birth: Giengen, Germany
Current Residence: Munich, Germany and Kaag-Dorp, Netherlands
Domain: Aerospace
Studied in college: Technical physics, business administration/operations and systems Management
Year joined INCOSE: 1996
Role(s) in INCOSE: Deputy chair tech board, Fellow, president (2004-05), life member
Years in systems engineering and program management: more than 50

Author's Note: We're breaking from tradition for this Spotlight and will be featuring statements that Heinz Stoewer developed based on one question we asked him that we thought readers would find interesting instead of the usual Q&A format.

Stoewer is a pioneer in aerospace systems engineering, most well-known for his work on Space Tug; Europe's first human space laboratory, Spacelab; many Earth focused satellites; and for infusing and broadening systems engineering in Europe and beyond.

Most recently, Stoewer was recognized as the 2018 Simon Ramo Medal winner "for pioneering accomplishments in and technical leadership of space systems engineering, and for profound influence on teaching and practice of systems engineering."

The award inspired the establishment of a new annual student prize (carrying Stoewer's name) for the best master's thesis of the year by the renowned aerospace faculty of the TU Delft.

Since the start of your aerospace career to now, what are the biggest changes you have seen in the use of systems engineering?

a. **From** simple engineering solutions **to** growing and sometimes not sufficiently well understood complex systems
b. **From** single purpose **to** systems with an abundance of functionalities
c. **From** systems with limited isolated software packages **to** systems with overwhelming software content where software has sometimes become the "system glue"
d. **From** a risk conscious decision culture **to** protracted risk averse decision making
e. **From** a product **to** an occasionally exaggerated process focus

f. **From** sometimes too strong a technical focus **to** a business orientation with an occasional lack of sufficient domain knowledge
g. **From** a limited set of technological choices **to** a diverse and rapidly changing technology inventory
h. **From** a cooperative acquisition environment **to** a lengthy legal and contracts dominated process
i. **From** empowered system and project teams **to** an overly "controlling and justification" culture
j. **From** pro-active change management **to** configuration management and bookkeeping
k. **From** a limited number of essential requirements **to** a plethora of detail requirements, which often constrain decision and design trade-off spaces during project execution
l. **From** documents-based information sets **to** digital environments with multi-dimensional product and process virtualization and visualization capabilities
m. **From** independent tools **to** an emerging interrelated digital environment
n. **From** extensive test articles and prototypes **to** digital twins and "virtual verification"
o. **From** "seat of the pants" decisions **to** more informed and substantiated analysis-based decisions
p. **From** sequential (waterfall) development approaches **to** more concurrent design, development, manufacturing and certification cycles
q. **From** partial system views **to** more holistic life-cycle "end-to-end" system implementation approaches
r. **From** product focused **to** more sustainable and services-oriented business models
s. **From** relatively well-defined projects **to** systems of systems whose boundaries, interfaces and evolutions are sometimes not well understood
t. **From** searching questions into cost and schedule overruns **to** a recognition that better up-front project attention can often prevent or mitigate later project failures
u. **From** a single company focus **to** extended enterprise and supply chain considerations
v. **From** single site hosted developments **to** a collaboration environment involving various sites and regions across the globe
w. **From** separate systems engineering and project management stovepipes **to** a recognition that the two are vitally interdependent
x. **From** an aerospace dominance in systems engineering **to** a recognition that systems engineering is a crucial discipline also in other industrial fields, e.g. automotive, shipbuilding, energy systems
y. **From** relying on past knowledge **to** continuous learning with an embrace of innovation and a more pronounced openness towards disruptive opportunities
z. **From** limited systems engineering recognition **to** a belief that systems engineering can solve most everything