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The Origin and Expansion of the System Safety Concept

In previous History Notes, I have addressed the genesis of our Society. Here, I will address the development of the system safety concept (SSC). The impetus for this was a request from Charlie Hoes (author of the *Journal of System Safety* column “TBD”) to help him better understand just where this concept came from, as well as its authors.

Of course, the SSC came into existence long before our Society, which was created primarily to promote the SSC. There are numerous opinions on this subject and many have been addressed, directly or indirectly in the pages of this *Journal* during the past 50 years. I suspect that a detailed examination would find they do not all agree. Realizing that this ambiguity may create some consternation among the really curious — and as the currently appointed Society Historian — I felt it best to attempt to define the milieu in which the system safety concept has advanced.

When invited to present the 50th anniversary address at the 2013 International System Safety Conference (ISSC) in Boston, I made a rather exhaustive search of pertinent writings relating to system safety. As with any writing on a complex subject, the author is influenced by personal experiences and opinions. Therefore, I state upfront that the following summary was formulated from my best take on the subject, my professional involvement in the early intercontinental ballistic missile (ICBM) programs and personal association with most of the key players noted here.

I readily admit there may well have been other totally unrelated developments in other fields and countries that could be considered as pertaining to the origin of the currently accepted implementation practice of the SSC. I would welcome feedback if any reader is aware of them.

In my opinion, those who came up with and fleshed out the SSC, as now normally defined by the ISSS, were an eclectic group whose primary common ground was the desire to reduce human tragedies and losses associated with preventable catastrophic accidents. This group includes, but is in no way limited to, the following:

- **Aircraft/Airline Safety and Accident Investigators:** Jerry Lederer (President, Flight Safety Foundation), Amos Woods (Boeing Commercial Aircraft), and C.O.(Chuck) Miller (Chief Test Pilot/Head of Flight Safety, Ling-Temco-Vought [LTV]). They each published papers (from 1937 to 1955) proposing that optimum safety needed to be addressed during the design phase, not during the flight testing/accident investigation phase, in new airplanes/systems development programs.
- **Missile System Managers:** Neil Classon (who, as early as 1958, had drafted and implemented the initial system safety programs on the Dyna-soar and Minuteman Air Force projects), Col. George Ruff (who had the vision and fortitude to get the initial system safety engineering contractual requirement (BSD 62-41) through the roadblocks of the old traditions and Air Force bureaucracy), and Gen. Robbins, the Minuteman Program Manager, who insisted that system safety be given priority attention on his projects, and thus ensured that the Minuteman System Safety Program was successful and served as an SSE model for subsequent U.S. DoD programs.
- **System Safety Concept Visionaries:** George Peters (who came up with the Society’s initial periodical *Hazard Prevention* and, as editor and author of numerous technical papers, pushed to expand the scope and practice of the SSC into fields other than aerospace), Dr. Ralph Vernon (who, at Texas A&M, did as much as anyone to promote the system safety concept in academia and directed the very successful system safety graduate degree program for the Army) and Dr. Peter Compes (who integrated system safety into his post-graduate safety engineering program at Wuppertal University in West Germany and was the first to graduate doctorate-level system safety-trained engineers into the workforce).

Being as old as I am, I had the distinct privilege of knowing and interacting with each of the above-named pioneers, except for Amos Wood. ●