D18 Scientific Data Integrity and Engineering Ethics: Test Manipulation, Data Alteration, Elimination of Safety Regulations, and the Theft of Scientific Records

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The goals of this presentation are to alert forensic professionals in the ways that testing, data, and safety standards have been manipulated and the manner in which multiple records of taxpayer-supported research have been intentionally suppressed, stolen, or destroyed. This loss of critical information negatively affects public safety and efforts to improve technology. This loss also allows defective, dangerous products to continue to be produced, placing the public at risk. None of this could happen if those involved followed the *Code of Ethics for Engineers*.

This presentation will impact the forensic science community by increasing awareness of how automakers, government officials, and others who are responsible for generating and maintaining objective and reliable scientific information have failed in many instances to properly carry out this responsibility in an ethical manner.

Since the 1940s, countless research projects were performed to advance scientific and engineering knowledge affecting the performance and safety of transportation vehicles for personal, occupational, or recreational pursuits. The present era, especially since the 1960s, showed the advent of many performance and safety regulations and related compliance testing. This includes thousands of scientific tests performed by manufacturers and independent researchers working for government agencies such as the Department Of Transportation (DOT), Department Of Defense (DOD), National Aeronautics and Space Administration (NASA), Consumer Product Safety Commission (CPSC), Occupational Safety and Health Administration (OSHA), the insurance industry, National Operating Committee on Standards for Athletic Equipment (NOCSAE), and others. These include functional, durability, and static tests on consumer goods, ground vehicles, aircraft and spacecraft components and structures, braking/handling/rollover tests, full-scale crash and sled tests of production and prototype vehicles, and full-scale dynamic flight tests of production and experimental aircraft and spacecraft.

The First Canon of Engineering and Scientific Ethics states: One's first duty is to the public. The vast majority of the foregoing test work was conducted in an ethical and scientifically reliable manner, resulting in improvements in the performance and safety of ground vehicles, aircraft, spacecraft, and consumer goods. Unfortunately, during the course of this work, there have also been numerous examples of engineering ethics violations. This has typically occurred when sufficient money and political influence affect interpretation of the often huge gaps between "state of the art," a "reasonably safe, reliable design," and what is "legal to sell" under minimal, often outdated, safety regulations. This conflict has affected forensic investigations and the safety and welfare of the public. These ethical violations and poor engineering judgements have occurred despite civil and criminal laws intended to prevent dangerous products from being sold to unsuspecting consumers. Such violations have also delayed and otherwise affected the safety interpretation, rule-making, and enforcement process. Despite *Daubert* and other gatekeeping rules, unethical "junk science" occurs with regularity in courtrooms.

Examples include: (1) suppression/destruction/sale of scientific records and/or experimental prototypes from taxpayer-funded research, which were supposed to be returned to government safekeeping; (2) manipulation of test conditions, alteration or fabrication of test data (e.g., conducting a "proof" rather than a "test"; (3) diminishing or

eliminating safety standards, with no possible public safety benefit, ignoring the National Transportation Safety Board and others opposing such changes; (4) stopping research on improving regulations that the responsible safety agency had admitted were "flawed and inadequate"; (5) conflict among government agencies (e.g., one DOT agency declaring a safety device unreliable and unsafe with another finding "no defects," despite multiple failures in crash testing and field investigations; and, (6) the theft or destruction of original taxpayer-funded test records or classified information from otherwise entrusted archives with subsequent cover-ups by institutions and individuals charged with upholding public safety.

The foregoing was witnessed or learned of during work on government safety research and defect investigations, private sector forensic investigations, and while performing testing with manufacturers, independent test laboratories, and government test facilities. One independent researcher physically searched government archives for extensive testing he had performed for that agency, relevant to critical safety issues affecting millions of vehicles; he was told "no such testing exists." If the author of unclassified test reports cannot gain access to them, how would another researcher, or ordinary citizens, possibly learn of their existence, let alone the implications for current and future safety issues?

Data Integrity, Engineering Ethics, Test Manipulation