ENHANCING ACCIDENT INVESTIGATIONS IN THE U.S. RAILROAD INDUSTRY

Stephen J. Reinach, Foster-Miller, Inc.

One of the most effective means of increasing workplace safety is to understand the diverse set of contributing factors that allow accidents to occur in order to develop and implement effective corrective actions to prevent future accidents. All too often, however, accident investigators point the finger at "human error" as the singular cause of accidents and try to "fix" the problem by addressing individual employee behavior. Human error, though, goes well beyond those individuals closest in time and space to the accident. Sources of human error can include inadequate local and senior management support and oversight; improper operating practices and procedures; poor design and fit of technologies, tools, and facilities; and negative influences within a work culture—in short, the entire socio-technical environment in which work is performed. The U.S. Federal Railroad Administration (FRA) recently sponsored a series of research studies to develop a theoretically-driven method to enhance current train accident investigation methods by helping investigators look beyond frontline employees to consider all aspects of the socio-technical environment in which work was performed. The goal of the research was to develop a method and one or more tools to help both FRA and the railroad industry improve the quality of their accident investigations by systematically considering human factors issues at all levels of the socio-technical environment. The foundation for the enhanced, systems-based accident investigation method was the use of a well-known human factors taxonomy of accident causation to drive both investigation and classification of accident contributing factors. Wiegmann and Shappell's Human Factors Analysis and Classification System (HFACS), based on James Reason's Swiss cheese model of accident causation, provided this foundation. This approach to enhancing accident investigations in the U.S. railroad industry shows promise as a tool that the railroad industry can use to more systematically identify human factor-based accident contributing factors. The use of a theoretically-driven accident investigation approach ensures that the contributing factors identified during an investigation go beyond what happened to why the accident occurred. Furthermore, use of the underlying taxonomy to classify contributing factors enables relationships between and among contributing factors to be identified more readily. This has implications for both individual railroads as well as large, national accident databases. Finally, and perhaps most importantly, one can identify corrective actions more readily to prevent accidents from recurring, since the data collected during the investigation highlight the underlying systemic problems that contributed to the accident in the first place.

CORRESPONDING AUTHOR: Stephen J. Reinach, Foster-Miller, Inc., 350 Second Ave., Waltham, MA 02451, USA