II STAMP: AN ACCIDENT MODEL BASED ON SYSTEMS THEORY

Part II introduces an expanded accident causality model based on the new assumptions in chapter 2 and satisfying the goals stemming from them. The theoretical foundation for the new model is systems theory, as introduced in chapter 3. Using this new causality model, called STAMP (Systems-Theoretic Accident Model and Processes), changes the emphasis in system safety from preventing failures to enforcing behavioral safety constraints. Component failure accidents are still included, but our conception of causality is extended to include component interaction accidents. Safety is reformulated as a control problem rather than a reliability problem. This change leads to much more powerful and effective ways to engineer safer systems, including the complex sociotechnical systems of most concern today.

The three main concepts in this model—safety constraints, hierarchical control structures, and process models—are introduced first in chapter 4. Then the STAMP causality model is described, along with a classification of accident causes implied by the new model.

To provide additional understanding of STAMP, it is used to describe the causes of several very different types of losses—a friendly fire shootdown of a U.S. Army helicopter by a U.S. Air Force fighter jet over northern Iraq, the contamination of a public water system with *E. coli* bacteria in a small town in Canada, and the loss of a Milstar satellite. Chapter 5 presents the friendly fire accident analysis. The other accident analyses are contained in appendixes B and C.

Engineering a Safer World

Systems Thinking Applied to Safety

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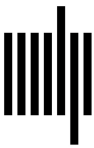

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