It is axiomatic that reality is more complex, nonlinear, and of a higher order than the academic model. Perhaps it is tautological also—teaching must illustrate the complex with the simple. More centrally, industry operates on a competitive edge. A practical issue, once solved by theory, belongs to everyone and to no one. A new edge must then be sought, relative to the issue, by refining details, replacing it by a more basic issue, or minimizing its role with a broader issue. The university most consistently leads technology in the inception of a field. Thereafter, it ignores the needs and insights of practice to its peril. Control is an old field.

The industrial view of control differs from the normal university abstraction in at least by these ways:

» Control is a broader activity in industry, much more so than implied by linear theory—it programs and integrates the function of the entire controlled system.

» Industrial controls are applied to nonlinear processes operating under large disturbances and often derived unconventionally from standard analytic formulations in the engineering field of the system to be controlled.

» High-order dynamics must be directly faced even when not sensibly modeled.

» Practical models are likely to be sound only if they are standard parts of the relevant industrial practice. Few engineers are good modelers.

» Industry is much more concerned about the economic value of time (to design and operate).

» The costs of failure are more serious and varied.

» A successful engineer contributes to his company’s commercial differentiation rather than some generalized concept of control.

» Industrial controls are designed and used by ordinary, ordinarily motivated people living ordinary lives. “Outstanding” industrial design work is ultimately based on

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