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## Safeguard Evaluation Protocol-

### A Decision Tree for Standardizing, Optionalizing, Prohibiting, Ignoring, Enhancing or Characterizing Safeguards

by Ralph L. Barnett<sup>1</sup> and Steven R. Schmid<sup>2</sup>

#### I. INTRODUCTION

*Presently, no methodology exists for rationally dealing with the conditions and circumstances under which candidate safeguards can be accepted or rejected. Decisions are generally grounded intuitively with guidance from codes, standards and industry practice. By and large sensible judgements flow from this approach; however, it is not error free and it does display randomness and inconsistency. Moreover, it fares rather poorly when the decision making procedures are challenged in courts or other tribunals.*

*A decision protocol is presented for assessing whether a candidate safeguard should be offered as standard or optional equipment or whether it should be enhanced, prohibited, ignored or just characterized. Satisfaction of the protocol is a sufficient condition for satisfying the Code of Ethics for Engineers, extant codes and standards, the Intrinsic Classification of Safeguards and the Dangerous Safeguard Consensus. Decisions that do not satisfy the protocol violate one or more of these safety philosophies. The protocol transforms the decision making process from an art form to an engineering discipline. It may be applied to any candidate safety feature on any system.*

#### II. EXAMPLE: REAR SEAT AIR BAG

To determine whether to offer rear seat air bags in automobiles, enter Fig. 1 at [1] and move down to value systems. Rear seat air bags are not presently used and there are no codes, standards, statutes or regulations that require, recommend or prohibit the use. Therefore, move to [4]. Assume for the purpose of this example that the candidate air bag has no downside; it either *helps or does nothing* from a safety point of view. Move to [9] and then to [12] since the automobile is a uni-functional machine. Because the air bag has no effect on the function of an automobile, we move to [16]. Air bags are quite expensive and will adversely effect cost, [19]. Proceeding to [24] which is the branch of *Unreasonable Economic Impact* associated with [9], we find three courses of action; the air bag for the rear seat may be offered as optional equipment [27], may not be offered [28] or advice on the characteristics and outsource availability may be given to vehicle users [29].

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The full text of this paper carefully defines and discusses each step in the decision protocol and describes the safety philosophies utilized. Many examples are fully discussed to illuminate the theory and illustrate the roles played by the Dependency Hypothesis, the Compatibility Hypothesis and the concepts of reasonably foreseeable use and reasonable economic impact. The relationship of the protocol to Barker v. Lull Engineering Co. and Bexiga v. Havir Mfg. Corp. is explored. This document is available from Triodyne, Inc. at a cost of \$25.00, prepaid. To order, call (708) 677-4730 ext.162.

# MACHINE SUPPLIER SAFEGUARD DECISION TREE

