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Subsequent Remedial Measures 2000 and Beyond

C. Paul Carver

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SUBSEQUENT REMEDIAL MEASURES 2000 AND BEYOND

By C. Paul Carver, Esq.[†]

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† The author is a trial lawyer at Bowman and Brooke L.L.P. in Minneapolis, Minnesota where he represents product manufacturers in products liability litigation. The views expressed herein are solely his own. I want to thank Professor Jon Hanson for reviewing an early version of this article and making valuable comments. I also want to thank Kelly for her support and R.S. and T.C. for their dogged enthusiasm.

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I. INTRODUCTION

The Federal Rule of Evidence 407 provides:

When, after an injury or harm allegedly caused by an event, measures are taken that, if taken previously, would have made the injury or harm less likely to occur, evidence of the subsequent measures is not admissible to prove negligence, culpable conduct, a defect in a product, a defect in a product's design, or a need for a warning or instruction. This rule does not require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving ownership, control, or feasibility of precautionary measures, if controverted, or impeachment.

Generally known as a subsequent remedial measure (SRM), in the products liability context, the rule is invoked where a change is made to a line of products after an accident occurs involving an existing product of a similar type. Less often the rule is asserted where a product is recalled after an accident. Some courts have also interpreted the rule to bar evidence of product line changes implemented before an accident occurs in an existing product.

In the past couple of decades, the rule and its state counterparts have been criticized for ambiguous language,² reliance on

1. "Unclear" means that a manufacturer has difficulty determining which jurisdictions it will be sued in and at what rate they will be sued in admit-jurisdictions versus exclude-jurisdictions. First, the manufacturer would determine the increased Pj for those jurisdictions where SRM evidence is admitted. Second, it would have to take into account the number of cases expected to be filed in admit jurisdictions (Pja) and the number expected to be filed in exclude jurisdictions (Pje) with some additional estimation for those jurisdictions where admission/exclusion is unclear (Pju) and ultimately combine these figures into a total Pj (as expressed in Figure 7) .

2. *E.g.*, EMERGING PROBLEMS UNDER THE FEDERAL RULES OF EVIDENCE 57 (2d ed. David A. Schlueter ed., 1991); Edward R. Becker & Aviva Orenstein, *The Federal Rules of Evidence After Sixteen Years—The Effect of "Plain Meaning" Jurisprudence, the Need for an Advisory Committee on the Rules of Evidence, and Suggestions for Selective Revision of the Rules*, 60 GEO. WASH. L. REV. 857, 894 (1992).

bad social policy,³ and non-uniform application.⁴ Significant attention has been paid to whether SRM evidence should be admitted in products liability cases analyzed under strict liability theories. The debate is carried out among academics and practitioners alike.⁵

The debate also sounds in the courts. In Federal courts, the

3. 2 JACK B. WEINSTEIN & MARGARET A. BERGER, WEINSTEIN'S FEDERAL EVIDENCE § 407.03[3][a] (Joseph M. McLaughlin, ed., 2d ed. 2000).

4. E.g., Margaret A. Berger, *The Federal Rules of Evidence: Defining and Refining the Goals of Codification*, 12 HOFSTRA L. REV. 255, 265-67 (1984).

5. E.g., Patricia A. Brass, *Federal Rule of Evidence 407: Should It Apply to Products Liability?*, 11 TOURO L. REV. 253 (1994); W.E. Brumby II, et al., *Evidence of Subsequent Remedial Measures in Product Liability Actions: Recent Conflict in the Circuit Courts*, 35 MERCER L. REV. 1389 (1984); Michele B. Colodney, *Federal Rule of Evidence 407 as Applied to Products Liability: A Rule in Need of Remedial Measures*, 48 U. MIAMI L. REV. 283 (1993); Thomas C. Fincham, *Federal Rule of Evidence 407 and Its State Variations: The Courts Perform Some "Subsequent Remedial Measures" of Their Own in Products Liability Cases*, 49 UMKC L. REV. 338 (1981); Barbara Strong Goss, *Subsequent Remedial Measures in Strict Liability: Later Opinions as Evidence of Defects in Earlier Reasoning*, 32 CATH. U.L. REV. 895 (1983); Roger C. Henderson, *Product Liability and Admissibility of Subsequent Remedial Measures: Resolving the Conflict by Recognizing the Difference Between Negligence and Strict Tort Liability*, 9 J. PROD. LIAB. 187 (1986); Joseph A. Hoffman & George D. Zuckerman, *Tort Reform and Rules of Evidence: Saving the Rule Excluding Evidence of Subsequent Remedial Actions*, 22 TORT & INS. L.J. 497 (1987); Matthew L. Kimball, *The Admissibility of Subsequent Remedial Measures in Strict Liability Actions: Some Suggestions Regarding Federal Rule of Evidence 407*, 39 WASH. & LEE L. REV. 1415 (1982); Jeffrey C. Palkovitz, *Evidence: Admissibility of Evidence of Subsequent Remedial Measures*, 38 WASH. & LEE L. REV. 671 (1981); Carol Proctor, *Evidence of Subsequent Remedial Measures and Products Liability*, 33 DEPAUL L. REV. 857 (1984); John F. Renzulli, *Strict Products Liability—Design Defect—Rule 407 of the Federal Rules of Evidence*, 28 N.Y.L. SCH. L. REV. 795 (1983); Faust F. Rossi, *The Ban on Evidence of Subsequent Remedial Measures: Why Does it Survive?*, 7 CORNELL L. FORUM 6 (1981); David E. Seidelson, *The Federal Rules of Evidence: A Few Surprises*, 12 HOFSTRA L. REV. 453 (1984); Allen Tish & Davidson Ream, *Does Rule 407 Apply to Strict Liability Actions?*, 26 FOR THE DEFENSE, No. 10 at 5 (1984); Timothy J. Young, *Torts—Products Liability—Subsequent Remedial Measures Admissible Under Allegations of Negligence and Strict Liability*, 67 MARQ. L. REV. 188 (1983); Michael W. Blanton, Comment, *Application of Federal Rule of Evidence 407 in Strict Products Liability Cases: The Evidence Weighs Against Automatic Exclusion*, 65 UMKC L. REV. 49 (1996); Irene W. Bruynes, Note, *Strict Liability and the Admissibility of Evidence of Subsequent Remedial Measures Under Evidence Rule 407*, 5 ALASKA L. REV. 333 (1988); Randolph L. Burns, Note, *Subsequent Remedial Measures and Strict Products Liability: A New—Relevant—Answer to an Old Problem*, 81 VA. L. REV. 1141 (1995); Joyce M. Cartun, Note, *Admissibility of Remedial Measures Evidence in Products Liability Actions: Towards a Balancing Test*, 39 HASTINGS L.J. 1171 (1988); Lev Dassin, Note, *Design Defects in the Rules Enabling Act: The Misapplication of Federal Rule of Evidence 407 to Strict Liability*, 65 N.Y.U. L. REV. 736 (1990); Wendy Bugher Greenley, Note, *Federal Rule of Evidence 407: New Controversy Besets the Admissibility of Subsequent Remedial Measures*, 30 VILL. L. REV. 1611 (1985); Thais L. Richardson, Comment, *The Proposed Amendment to Federal Rule of Evidence 407: A Subsequent Remedial Measure that Does Not Fix the Problem*, 45 AM. U. L. REV. 1453 (1996); Eric L. Vinson, Note, *Applying Federal Rule of Evidence 407 in Strict Liability: A Discussion of Changes to the Rule*, 16 REV. LITIG. 773 (1997).

debate came to a head when direct conflicts among the circuits led to an amendment to the rule in 1997 that firmly established its application to strict liability claims.⁶ Still though, differences among the states and federal courts, as well as the narrow application of the rule (to accidents occurring before and precipitating the SRM) suggests it is an insignificant, even harmful, exclusionary rule poised to do much more.

The current debates signal likely evolution in the coming decades. Efforts at tort reform and creation of a uniform national standard are likely to gain favor, especially as the economy continues to blur geographical differences making jurisdictional differences all the more cumbersome. Short of a national standard, changes are likely on a couple of fronts. First, incremental change will likely occur as states adopt the new federal rule. Second, courts will continue to grapple with forum shopping issues including choice of law and *Erie* questions – this appears to be the most likely issue to be addressed by the Supreme Court. Third, courts are likely to create a rift as many give opposing interpretations of the "event" which triggers exclusion. Conversely, incremental change is not likely to occur to the list of exceptions to the exclusionary rule. This is especially unfortunate because of the negative effect the exceptions have on the rule's potential to make manufacturers act responsibly. Thus one can safely anticipate significant conflict and the increased cost of litigation that typically accompanies it.

Interestingly, there is a vacuum when one looks for hard evidence to support or refute different interpretations of the rule. On a positive note, if the debate comes to a head, one can expect a mustering of evidence to supplant the feelings that have largely supported the dialogue to date. This article looks at the arguments behind SRM rules and examines what the rules can and should do in the coming decades.

II. OVERVIEW

Part I presents an overview of the current status of SRM law in

6. Compare *Flaminio v. Honda Motor Co. Ltd.*, 733 F.2d 463, 468 (7th Cir. 1984) (excluding SRM evidence) with *Herndon v. Seven Bar Flying Serv., Inc.*, 716 F.2d 1322, 1329 (10th Cir. 1983) (admitting SRM evidence). State courts have also engaged in the debate. Compare *Davis v. Int'l Harvester Co.*, 521 N.E.2d 1282, 1291 (Ill. App. Ct. 1988) (excluding SRM evidence) with *Ault v. Int'l Harvester Co.*, 528 P.2d 1148, 1153 (Cal. 1974) (admitting SRM evidence) and *Maietta v. Int'l Harvester Co.*, 496 A.2d 286, 293 (Me. 1985) (admitting SRM evidence).

state and federal jurisdictions and the SRM issues which confront product manufacturers. Part II outlines the arguments that both provide the underpinnings of SRM rules and serve to support interpretations of the rules. In Part III, the article demonstrates the potential contained within SRM rules that may be tapped in the future. Part IV concludes that because of exceptions, non-uniformity, and narrow application, current SRM law is a post hoc litigation artifice for clever lawyers to use to their client's advantage rather than a uniform rule capable of generating reasonable and safe product design decisions.

III. THE LAW

The text of various state rules vary slightly within fairly well defined parameters. However, the interpretations of the rules cover a wide continuum. Section A presents the sources of the text of SRM rules, and Section B presents the interpretations.

A. *Sources of the Rules*

State and federal evidentiary rules and case law, or some combination of the two, address SRMs.

1. *Evidence Rules*

There are four basic forms of SRM rules currently in force in the U.S. The federal version expressly addresses products liability and excludes SRM evidence. It provides:

When, after an injury or harm allegedly caused by an event, measures are taken that, if taken previously, would have made the injury or harm less likely to occur, evidence of the subsequent measures is not admissible to prove negligence, culpable conduct, a defect in a product, a defect in a product's design, or a need for a warning or instruction. This rule does not require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving ownership, control, or feasibility of precautionary measures, if controverted, or impeachment.⁷

Several states used a similar rule prior to adoption of the new

7. FED. R. EVID. 407 (2000).

federal rule and thus language variations exist.⁸

A second form of rule uses the text from the old Federal Rule 407 that expressly excludes SRM evidence in negligence cases but is silent as to strict products liability cases.⁹ For example, the old federal rule provides:

When, after an event, measures are taken which, if taken previously, would have made the event less likely to occur, evidence of the subsequent measures is not admissible to prove negligence or culpable conduct in connection with the event. This rule does not require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving ownership, control, or feasibility of precautionary measures, if controverted, or impeachment.¹⁰

The third form of rule expressly addresses products liability and admits SRM evidence in those cases, though the evidence is excluded in negligence cases.¹¹ Hawaii's rule is representative. It provides:

When, after an event, measures are taken which, if taken previously, would have made the event less likely to occur, evidence of the subsequent measures is not admissible to prove negligence or culpable conduct in connection with the event. This rule does not require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving dangerous defect in products liability cases, ownership, control, or feasibility or precautionary measures, if controverted, or impeachment.¹²

8. 1 GREGORY P. JOSEPH & STEPHEN A. SALTZBURG, EVIDENCE IN AMERICA: THE FEDERAL RULES IN THE STATES § 17.2 (The Michie Pub. Co. 1987, Supp. 1992). For example Nebraska's rule provides:

When, after an event, measures are taken which, if taken previously, would have made the event less likely to occur, evidence of the subsequent measures is not admissible to prove negligence or culpable conduct in connection with the event. This rule does not require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving ownership, control, or feasibility of precautionary measures, if controverted, or impeachment. *Negligence or culpable conduct, as used in this rule, shall include, but not be limited to, the manufacture or sale of a defective product.*

NEB. R. EVID. 407 (emphasis added).

9. JOSEPH & SALTZBURG, *supra* note 8, § 17.2.

10. FED. R. EVID. 407 (1996).

11. JOSEPH & SALTZBURG, *supra* note 8, § 17.2.

12. HAW. R. EVID. 407.

Finally, Rhode Island admits SRM evidence in products liability and negligence cases: "When, after an event, measures are taken which, if taken previously, would have made the event less likely to occur, evidence of the subsequent measures is admissible."¹³

2. Case Law

Some states have no formal evidence rule dealing with SRMs in products liability cases.¹⁴ But most have addressed the SRM issue through case law with a fairly even split between admission and exclusion.¹⁵

B. Interpreting Evidentiary And Case-based SRM Rules

Despite the similarity of the words used in the rules, many different interpretations have grown from them. This phenomenon is illustrated by the former federal rule. It is the single most used incarnation, yet there is great variation in the interpretation put on it by the states adopting it.¹⁶ Even the federal circuits did not agree on a uniform interpretation. Indeed the Seventh and Tenth Circuits reached polar-opposite interpretations regarding the old Rule 407's application in products liability cases.¹⁷

So a textual analysis of a rule is rarely enough to determine how SRMs will be treated. Instead one must determine the view to which a particular jurisdiction subscribes. There are three general views.

13. R.I. R. EVID. 407.

14. Thomas S. Stewart & Stacy M. Andreas, *Subsequent Remedial Measures: An Analytical Model for Product Liability Cases*, 26 TORT & INS. L.J. 74, 92-96 (1990). While the Stewart and Andreas article is a decade old it provides a good synopsis of the 50 states' treatment of SRMs. Obviously changes have occurred, but it is beyond the scope of this article to survey the details.

15. *Id.* at 92-96.

16. Compare *Davis v. Int'l Harvester Co.*, 521 N.E.2d 1282, 1287 (Ill. App. Ct. 1988) (adopting the old federal rule verbatim and excluding SRMs in products liability cases) with *Caldwell v. Yamaha Motor Co. Ltd.*, 648 P.2d 519, 525 (Wyo. 1982) (adopting the old federal rule 407 verbatim and admitting SRMs in products liability cases).

17. Compare *Herndon v. Seven Bar Flying Serv., Inc.*, 716 F.2d 1322, 1331 (10th Cir. 1983) (admitting SRMs in products liability cases) with *Flaminio v. Honda Motor Co., Ltd.*, 733 F.2d 463, 469 (7th Cir. 1984) (excluding SRMs in products liability cases).

1. *View That SRM Should Never Be Excluded*

Since this position is contrary to common law, it has been clearly stated in positive law.¹⁸ The driving force behind this position appears to be based on relevance. In other words, jurisdictions adopting it note the relevance of SRM evidence and leave its admission to the discretion of the trial judge.

2. *View That SRM Should Be Excluded Only In Negligence Actions.*

This view is widely held.¹⁹ The plain language of both the former and current federal rule expressly provides for exclusion in cases involving negligence. Excluding SRMs in negligence cases has its origins in the common law.²⁰

The essence of this view is a recognition that negligence seeks to place responsibility on the party at fault but that SRM evidence is not indicative of fault and is highly prejudicial to that inquiry.²¹ The argument continues; exclusion in strict products liability cases is unnecessary because fault is not an issue there. Thus SRMs are only excluded in negligence actions.

3. *View That SRM Should Be Excluded In Both Negligence And Strict Liability Actions*

About one third of the states and all the federal circuits adhere to this view.²² As noted, some states expressly incorporate this view into their respective SRM rules. More typically, states rely on a forced reading of the relevant evidence rule or a complete disregard of its language to get the rule to embrace this view.

For example, the former FED. R. EVID. 407 does not mention strict liability, so reliance on that rule to exclude SRM evidence in strict liability actions required an expansive reading of the text. Some jurisdictions accomplish this expansion through the words

18. JOSEPH & SALTZBURG, *supra* note 8, § 17.3.

19. DAVID W. LOUISELL & CHRISTOPHER B. MUELLER, 2 *Federal Evidence* 411-13 (Revised ed., Lawyers Coop. Pub. Co. 1985, Supp. 1992).

20. Joseph & Saltzburg, *supra* note 8, § 17.3; Goss, *supra* note 4, at 906-12 (arguing that common law also supports exclusion in strict liability cases). *See also*, Baron Bramwell's opinion in *Hart v. Lancashire & Yorkshire Ry. Co.*, 21 L.T.N.S. 261, 263 (1869) explained *infra* in text accompanying notes 45-47.

21. I STEPHAN A. SALTZBURG, ET AL., FEDERAL RULES OF EVIDENCE MANUAL 571-72 (7th ed., LEXIS Law Publishing 1998).

22. LOUISELL & MUELLER, *supra* note 19, at 417-19; *see also* Stewart & Andreas, *supra* note 14, at 92-96.

"culpable conduct."²³ These jurisdictions argue that "culpable conduct" must be something more than negligence; otherwise inclusion of that phrase in the rule would be redundant. Thus "culpable conduct" must contemplate strict liability.

Another expansive argument simply notes that exclusion in strict products liability cases is not expressly, prohibited by typical SRM rules, and that furthermore, the theory behind excluding SRM evidence in negligence actions applies with equal force in products cases.²⁴ The argument concludes that even though the focus in a strict liability action is on defect not fault, SRM evidence is still prejudicial and subject to abuse by juries, and therefore it should be excluded.²⁵

C. Issues Manufacturers Must Consider Under Current SRM Law

Without question current SRM law creates incentives and disincentives. Just what they are and how they affect manufacturers' decisions is not quite so obvious.

1. Defining A Subsequent Remedial Measure

The first problem a manufacturer must grapple with when contemplating a product change is determining when a change is an SRM. Not all changes are considered SRMs under the rules. Both of the following examples describe a subsequent improvement, but only one is considered an SRM in most jurisdictions.

Example 1. At T1,²⁶ a manufacturer designs and produces several products. At T2 one of those products is involved in an accident. At T3, the manufacturer is made aware of the accident, and in response to it, the manufacturer makes a design change. At T4, the injured purchaser brings a products liability suit.

Example 2. At T1, a manufacturer designs and produces several products. At T2, through research and development, the manufacturer discovers a safety enhancing innovation and implements it in a new generation of products. At T3, a first generation product is involved in an accident. At T4, the injured purchaser

23. *Traylor v. Husqvarna Motor*, 988 F.2d 729, 733 (7th Cir. 1993) (understanding "culpable conduct" to include the creation of a product defect).

24. *E.g., Flaminio v. Honda Motor Co., Ltd.*, 733 F.2d 463, 469 (7th Cir. 1984).

25. *Id.*

26. T1 = a point in time, T2 = a subsequent point, etc.

brings a products liability suit.

In both examples a change has been made subsequent to the original design in response to some sort of testing of the product.²⁷ However, only Example 1 is widely considered an SRM.²⁸ This conclusion arises from an interpretation of the "event" referenced in most rules. The typical rule requires the remedial measure to be taken after an event, and this event has largely been construed to be an injury, as the federal rule now expressly provides. Thus, Example 2 is generally not treated as an SRM because the change was made before the event.²⁹

2. *Uniformity*

Once a manufacturer decides if the change it is contemplating is in fact an SRM, it must ascertain which interpretation of SRM law will apply. As sections A and B imply, that determination can be complex. It is, however, critical to the manufacturer's determination of expected liability (which is ultimately an element of the product's price).

To determine expected liability for a given product, a manufacturer must anticipate which rules will apply in eventual lawsuits. Consequently, it must determine the jurisdictions in which it will be sued, and if different jurisdictions treat the same issues in different ways then manufacturers must take account of all possible treatments and the likelihood of ending up in one jurisdiction versus

27. Testing in Example 1 is the accident that puts the manufacturer on notice of a possible improvement needed in the product. Testing might also be research and development which engineers a safer product.

28. *E.g.*, FED. R. EVID. 407 (expressly stating that the change must come after the injury); *Traylor*, 988 F.2d at 733 (arguing that using the injury as the event is a policy choice which balances the incentive for manufacturers to take SRMs against permitting the finder of fact to consider probative evidence; pushing the event back farther than the injury unfairly tips the balance in favor of the manufacturer); *Kaczmarek v. Allied Chem. Corp.*, 836 F.2d 1055, 1060 (7th Cir. 1987) (arguing that the incentive rational is weakened where no accident had yet occurred so there was no need to exclude a product change implemented as a result of a decision made independent of the accident); *Raymond v. Raymond Corp.*, 938 F.2d 1518, 1523 (1st Cir. 1991) (stating that only remedial measures taken after an "event" are excluded).

29. *But see*, *Brown v. Ford Motor Co.*, 714 N.E.2d 556, 558 (Ill. App. Ct. 1999) (excluding pre-injury change because "the same policy consideration, i.e., the potential chilling effect on safety improvements, [was] present in product liability actions...regardless of whether the modifications were pre-injury or post-injury." (quoting *Smith v. Black & Decker*, 650 N.E.2d 1108, 1113 (Ill. App. Ct. 1995))).

another.³⁰ This is typically a complex and perhaps unworkable problem. The end result of lack of uniformity is that the measurable incentive inherent in exclusion of the evidence is dulled.³¹

3. *Forum Shopping*

Lack of uniformity encourages plaintiffs to sue in courts with SRM admission rules.³² Where SRM evidence is admissible, it is a simple matter of having more favorable evidence to make a case.

4. *The Rule-based Exceptions*

Most SRM rules provide for admission of SRM evidence in certain circumstances even if that evidence is generally excluded.³³ Some argue that the exceptions have swallowed the rule.³⁴ Others note that at a minimum much attention must be paid in answering complaints and discovery and formulating trial strategy so as not to trigger the exceptions.³⁵ To the extent the exceptions have become the "rule," the view that SRMs should always be admitted prevails. Thus, notwithstanding the language of a given rule, admission of SRM evidence can be expected.

30. Cf. *Ault v. Int'l Harvester Co.*, 528 P.2d 1148, 1155 n.1 (Cal. 1974). also *Goss*, *supra* note 4, at 936-40 (noting the importance of uniformity where incentives are expected to induce certain behaviors); Karen A. DiLisio, *The Admissibility of Subsequent Remedial Measures in a Products Liability Case*, 3 PROD. LIAB. L.J. 222, 239-40 (1992). To illustrate the general point consider the dilemma for one company-International Truck and Engine Corporation (f/k/a International Harvester) which is often involved in products liability suits. It was the defendant in each of the following cases decided in 1985: *Dixon v. Int'l Harvester Co.*, 754 F.2d 573 (5th Cir. 1985); *Bandstra v. Int'l Harvester Co.*, 367 N.W.2d 282 (Iowa Ct. App. 1985); *Maietta v. Int'l Harvester Co.*, 496 A.2d 286 (Me. 1985). In the Fifth Circuit, SRM evidence was excluded in all actions. In Iowa, SRM evidence was excluded in negligence claims but not in products liability claims. In Maine, SRM evidence was admitted in all actions (until a recent rule change which excluded the evidence in all actions). This is a small yet telling example of the lack of uniformity – and continuing evolution – under current law.

31. *Goss*, *supra* note 4, at 936-40 (noting the importance of uniformity where incentives are expected to induce certain behaviors).

32. E.g., Daniel Ogburn, *Subsequent Remedial Measures and the Application of California Law in a Diversity Action*, 39 SANTA CLARA L. REV. 615 (1999).

33. FED. R. EVID. 407. "This rule does not require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving ownership, control, or feasibility of precautionary measures, if controverted, or impeachment." *Id.*

34. MICHAEL H. GRAHAM, 1 MODERN STATE AND FEDERAL EVIDENCE: A COMPREHENSIVE REFERENCE TEXT 480 (1989).

35. STEWART & ANDREAS, *supra* note 14, at 81-83.

IV. SRM EVIDENCE ADMISSION—ARGUMENTS PRO AND CON

The focus of this part shifts to the arguments that provide the framework of SRM rules. These arguments are meant to illustrate the bases of the conflicts in SRM law and to provide a backdrop against which the analyses in Part III may be considered.

For every interpretation of SRM rules presented in Part I, there is at least one argument in favor of it and one opposed. To illustrate the great diversity of views, the arguments are presented in point/counterpoint form—with the former favoring admission and the latter favoring exclusion.

POINT: THE RELEVANCY ARGUMENT.

A true strict liability claim does not focus on the conduct of a manufacturer; instead, the focus is on the product.³⁶ The liability question in products liability depends on whether the product is defective in design, manufacture, or warning. SRM evidence may assist in answering the defect question,³⁷ whether judged from a consumer expectation or risk-utility standpoint, therefore it is relevant.³⁸

COUNTERPOINT: THE TRUE LIABILITY RULE ARGUMENT

While it is true that nominally the standard in a products liability case is strict liability, in practice the standard is reasonableness,³⁹ and thus the same SRM rules should apply in products liability cases as apply in negligence cases.⁴⁰ Examining the risk/utility of a product, or some component of a product, is a surrogate for examining the manufacturer's exercise of due care.⁴¹ A product is defec-

36. HENDERSON, *supra* note 4, at 197-201. See also *Herndon v. Seven Bar Flying Serv., Inc.*, 716 F.2d 1322, 1327-28 (10th Cir. 1983); *Ault v. Int'l Harvester Co.*, 528 P.2d 1148, 1150 (Cal. 1974) (citing *Greenman v. Yuba Power Products, Inc.*, 377 P.2d 897 (Cal. 1963)).

37. *Herndon*, 716 F.2d at 1328.

38. *Traylor v. Husqvarna Motor*, 988 F.2d 729, 733 (7th Cir. 1992) (noting that the evidence is relevant and only excluded as a policy choice). *But see* BURNS, *supra* note 4, at 1166-73.

39. *Prentis v. Yale Mfg. Co.*, 323 N.W.2d 444 (Mich. 1982) *rev'd*, 365 N.W.2d 176 (Mich. 1984) (stating, "[t]he risk-utility balancing test is merely a detailed version of Judge Learned Hand's negligence calculus. As Dean Prosser has pointed out, the liability of the manufacturer rests "upon a departure from proper standards of care, so that the tort is essentially a matter of negligence") (citing PROSSER, TORTS (4th ed.) § 96). *United States v. Carrol Towing Co.*, 159 F.2d 169, 173 (CA 2, 1947).

40. See generally *supra* note 2, at 66-7 (noting the different strict liability theories involved in products liability and cautioning that SRM rules should apply where those theories resemble negligence but probably not otherwise).

41. E.g., *Prentis*, *supra* note 39 at 444.

tive or not on its own. Introducing a subsequent design as proof that the prior design is defective does not assist the risk benefit analysis. Rather it changes the liability question from "Was this design okay?" to "Was there a better design?"

POINT: THE IGNORANT MANUFACTURER ARGUMENT

The court in *Herndon v. Seven Bar Flying Service, Inc.*⁴² stated, "...there is no evidence which shows that manufacturers even know about the evidentiary rule [FED. R. EVID. 407] or change their behavior because of it."⁴³ Incentive-based arguments are mere academic musings. Manufacturers do not make design decisions based on them. Since SRM evidence is relevant to the case, it should be admitted.

COUNTERPOINT: HOLMES' BAD MAN

Common sense alone sparks disbelief. After all, this is a far cry from Holmes' Bad Man whose actions challenge the outer boundaries of the law.⁴⁴ It might instead be called Doyle's Lazy Person.⁴⁵ Contrary to Judge Doyle's assertions, there is evidence of both manufacturers' knowledge of SRM rules and anguish over SRM decisions in light of the rules.⁴⁶ Thus the evidence suggests that

42. 716 F.2d 1322 (10th Cir. 1983).

43. *Id.* at 1328.

44. Oliver W. Holmes, *The Path of the Law*, 10 HARV. L. REV. 457, 459-62 (1897).

45. *Herndon*, *supra* note 5 at 1324. The Honorable William E. Doyle wrote the majority opinion in *Herndon*.

46. A number of articles have been written with manufacturers in mind. , e.g., Dorothy Dey, *Subsequent Remedial Measures*, 25, FOR THE DEFENSE No. 7, 7-10 (1983); Stephen L. Liebo, *Products and Subsequent Remedial Measures*, FOR THE DEFENSE No. 12 (1981); Allen Tish & Davidson Ream, *Does Rule 407 Apply to Strict Liability Actions?*, 26 FOR THE DEFENSE No. 10, 5-95 (1984). The Bureau of National Affairs publishes a Corporate Practice Series including: Alvin G. Greenwald & Roy H. Brisbois, *Guide to Products Liability . . . A Practical Guide For The Corporate Counselor* (BNA 1987) (including advice on careful drafting of recall notices in light of SRM rules). There is substantial reporting on proposed product liability bills including SRM considerations: Michael Bradford, *Tort Reform Proponents See Boost From Bush Plan*, Business Insurance (Feb. 17, 1992, Crain Communications, Inc. NEXIS); *Bipartisan Compromise Would Drop Caps From Senator Danforth's Bill*, Daily Report For Executives (Sept. 26, 1986, BNA, Inc., NEXIS); Eric Whisenhunt, *The Bucks Stop Where?*, Michigan Business (Dec. 1986, Business Journal Pub. Co. NEXIS). There is also reporting in the popular media: Daniel B. Moskowitz, *Lack of Uniformity in Rules of Evidence Hampers Companies*, The Washington Post (Final Edition), Oct. 19, 1992, at F11 (opening with an explanation of what a manufacturer is faced with regarding the decision whether to make a SRM); Eleanor Randolph, *Agonizing Self Criticism May Embarrass CBS*, THE WASHINGTON POST (Final Edition), Nov. 25, 1984, at A6 (describing the theory behind SRMs and their involvement in the Westmoreland case); Jane Seaberry, court upholds

manufacturers are rational actors not lazy spectators, so incentive-based SRM rules can and do influence manufacturers' behavior.

POINT: THE PLAIN LANGUAGE ARGUMENT

The plain language of most rules speaks of exclusion where SRM evidence is offered to prove negligence or culpable conduct. No mention is made of strict liability thus those actions are not contemplated by the rules.⁴⁷ Finally, the lack of mention of strict liability actions in the legislative history of most rules supports the conclusion that those actions are not covered by the rules.⁴⁸

COUNTERPOINT: THE CULPABLE CONDUCT ARGUMENT

The words "culpable conduct" contemplate strict liability actions.⁴⁹ Culpable conduct must be more than mere negligence. Equating it with negligence attributes a sloppy and meaningless redundancy to the drafters of most SRM rules. Instead, culpable conduct includes strict products liability actions. Culpable conduct includes conduct that breaches a legal duty. Manufacturers have a legal duty not to place unsafe products on the market. So if a manufacturer places an unsafe product on the market, it is guilty of culpable conduct. As such, SRM evidence in products liability actions should be excluded under the express provisions of most rules that forbid use of evidence of culpable conduct.

POINT: THE BRAMWELL ARGUMENT

In *Hart v. Lancashire & Yorkshire Railway Co.*⁵⁰, Baron Bramwell observed:

People do not furnish evidence against themselves simply by

Evidence Curb in Ford Lawsuit, THE WASHINGTON POST (Final Edition), May 4, 1982, at D6 (describing the public policy behind SRM rules); Post-accident Design Changes, Business Week (Industrial Edition), Oct. 5, 1981 at 132 (noting public policy behind SRM rules). Finally, in an especially revealing article, counsel for Piper aircraft discussed the frustrations of current SRM rules: Despite Setback, Piper's Product Liability Experiment Continues? The Weekly of Business Aviation (Vol. 48, No. 13, March 27, 1989; McGraw-Hill Inc.) (noting the economic incentive to delay SRMs, the possible crushing liability, and the general confused state of SRM law).

47. *Ault v. Int'l Harvester Co.*, 528 P.2d 1148, 1150 (Cal. 1974).

48. FED. R. EVID. 407, Advisory Committee's Notes

49. *Traylor v. Husqvarna Motor*, 988 F.2d 729, 731 (7th Cir. 1992); *Flaminio v. Honda Motor Co., Ltd.*, 733 F.2d 463, 468-70 (7th Cir. 1984). See also *Ault*, 528 P.2d at 1154-55 (Clark, J., dissenting). But see COLO. R. EVID. 407 Committee Comment (noting that culpable conduct does not encompass strict liability actions); WYO. R. EVID. 407 Committee Note (noting that culpable conduct does not encompass strict liability actions).

50. 21 L.T.N.S. 261 (1869).

adopting a new plan in order to prevent the recurrence of an accident. I think that a proposition to the contrary would be barbarous. It would be (as I have often had occasion to tell juries) to hold that, because the world gets wiser as it gets older, therefore it was foolish before.⁵¹

Underlying Bramwell's statement is the notion that admitting this evidence will discourage an individual from remedying or repairing a dangerous situation. By guaranteeing exclusion of the evidence, the disincentive to correct the dangerous situation is removed and hopefully the individual will make the repair. Bramwell was addressing a classic negligence question, where a solitary accident was at issue.

COUNTERPOINT: THE BRAMWELL ARGUMENT REVISITED

A close reading of the Bramwell Argument supports exclusion of SRM evidence in strict products liability actions as well.⁵² Based on the assumption that a manufacturer learns from each new event (including product accidents), it does in fact get wiser as it gets older. This does not imply that it was dumb before or, in products liability lingo, that its older designs become defective once newer ones are developed. Holding a manufacturer liable for not knowing then, what it knows now (which is what admission of SRM evidence attempts) is precisely what Bramwell warned against.

POINT: CASE-BY-CASE BALANCING

SRM exclusion should be resolved on a case-by-case basis.⁵³ Courts should use the balancing approach of FED. R. EVID. 403. Courts would have greater flexibility to handle SRM evidence.

COUNTERPOINT: ONLY CLEAR RULES CREATE CLEAR INCENTIVES

Balancing undercuts any opportunity for creating a system of incentives for manufacturers. If they do not know what will be excluded until trial then they cannot make decisions based on how the change will be treated at trial. Furthermore this approach suffers from the same lack of uniformity problem plaguing the present state of law. Finally, such an approach is contrary to the spirit if not the text of the Federal Rules of Evidence. The rules have already recognized that SRM evidence is deserving of special treatment re-

51. *Id.* at 263

52. *Flaminio*, *supra* note 6 at 471.

53. CARTUN, *supra* note 5, at 1172-73; Brent R. Johnson, *The Uncertain Fate of Remedial Evidence: Victim of an Illogical Imposition of Federal Rule of Evidence 407*, 20 WM. MITCHELL L. REV. 191, 219-21 (1994).

garding relevance. Like offers to compromise, plea agreements, medical agreements, and liability insurance, SRMs have been singled out as rising above the baseline balancing of probative value versus prejudicial effect. Case-by-case balancing is a step back in the evolution of SRM law.⁵⁴

POINT: THE AULT ARGUMENT

In *Ault v. International Harvester Co.*, the California Supreme Court held that public policy considerations which justify an SRM exclusionary rule in negligence cases are not present in the products liability context. "The contemporary corporate mass producer of goods..." is one who "...manufactures tens of thousands of units of goods..."⁵⁵ For this type of manufacturer, it is manifestly unrealistic to suggest that such a producer will forego making improvements in its product, and risk innumerable additional lawsuits and the attendant adverse effect upon its public image, simply because evidence of adoption of such improvement may be admitted in an action founded on strict liability for recovery on an injury that preceded the improvement.⁵⁶

Manufacturers will not make manufacturing and redesign decisions based on possible exclusions. Therefore introduction of SRM evidence will not dissuade them from making desirable improvements. Given the relevance of SRM evidence, it might just as well be admitted in product liability trials.

COUNTERPOINT: THE RATIONAL ECONOMIC ACTOR

The analysis of *Ault* is incomplete,⁵⁷ it fails to recognize and appreciate the incentive scheme inherent in SRM rules. Manufacturers, large and small, make product decisions based upon what will sell in the free market. Cost is a factor, and liability exposure is

54. See generally, BURNS, *supra* note 5.

55. *Ault v. Int'l Harvester Co.*, 528 P.2d 1148, 1152 (Cal. 1974).

56. *Id.*

57. *Id.* See also, GOSS, *supra* note 5, at 931-32 (noting that the mass producer argument assumes a defect in the product in question). A major shortcoming of *Ault* is its lack of foundation for the conclusions reached. The only support states that "[a] distributor would probably face greater total liability by allowing such defective products to remain on the market. . . ." See also Note, *Products Liability and Evidence of Subsequent Repairs*, 1972 DUKE L.J. 837, 849 (1972). The *Ault* court also cites an Illinois case, *Sutkowski v. Universal Marion Corp.*, 281 N.E.2d 749, 749 (Ill. App. Ct. 1972), as "direct support" for its conclusions, however while that case reached the same conclusion, it did not use the same reasoning. *Sutkowski* instead relied on the focus-on-the-product argument, and on the relevance of SRM evidence. *Id.* at 752. Even proponents criticize *Ault* for its limiting language. It expressly applies only to so-called "mass producers" causing some to question whether the *Ault* conclusion should be applied to relatively smaller producers.

a component of cost. *Ault* failed to recognize that a product change may invite "innumerable additional lawsuits." Thus the potential for lawsuits must be considered as an additional cost of a change rather than an unquestionable catalyst for change. Finally, in these days of Clinton scandals and corporate apologies, negative public image is short-lived at worst. This counterpoint is the focus of the next section.

V. PROVING THE BENEFITS OF SRM EXCLUSION

A. Assumptions

Some assumptions are based on the best available evidence. Others are made to control for certain variables.

1. SRMs include all changes to a manufacturer's products, whether they result from research and development or product accidents, made at any time, without reference to any event such as a product accident.⁵⁸

2. Admission of SRM evidence will increase the probability of liability (P) for any given product.⁵⁹

3. Manufacturers are capable of predicting the probability of liability for a given product both where SRMs are admitted and

58. LOUISELL & MUELLER, *supra* note 18, at 387 (suggesting that all changes are indistinguishable vis a vis SRM rules and should therefore be treated the same under those rules).

59. Bramwell recognized this in his classic justification for excluding SRMs in negligence actions. *supra* notes 46-48 and accompanying text. *See also* Tish, *supra* note 4, at 5 (noting that introduction of SRM evidence clearly influences the outcome of products liability trials).

Victor J. Gold, *Jury Wobble: Judicial Tolerance of Jury Inferential Error*, 59 S. CAL. L. REV. 391, 391-92, 400 (1986). Gold argues that juries are error prone especially where inferences are likely and that corrective instructions and the advocacy system are ill-equipped to meet the problem. The only guard against misconstruing SRM evidence is an instruction from the court. While juries seem to be comfortable with this guard, it is probably a false comfort at best. There is reason to believe that this protection is inadequate, and that SRM evidence is in fact misused. *Id.* Chief Justice Earl Warren conference on Advocacy in the United States, *The American Jury System: Final Report*, (Roscoe Pound American Trial Lawyers Foundation 1977) (recognizing lack of intellectual capacity of jurors including their inability to understand testimony, or scientific evidence). *See also* *Ault v. Int'l Harvester Co.*, 528 P.2d 1148, 1157 (Clark, J. dissenting). The dissent in *Ault* affirms the pro-plaintiff value of SRM evidence. The first trial of that case ended in a hung jury. At the second trial, plaintiff's counsel "...included constant emphasis of the subsequent change. . .resulting in a plaintiff's verdict." *Id.* at 1157.

where they are excluded.⁶⁰

4. There are two types of SRMs: the design-change model and the recall model. The design-change model, characterized by a product change some amount of time after the product has been on the market, represents the majority of SRM scenarios.⁶¹ The recall model is characterized by a change in and potential recall of a product some time after it is first marketed. With this model, the SRM actually changes products currently in use.⁶²

5. Manufacturers can predict the magnitude of losses (L).

6. Manufacturers anticipate the level of production of any given product and take expected liability levels into account in making production decisions in order to maximize profits.⁶³

7. Manufacturers are able to predict the costs (C) of SRMs and will only take SRMs when they are profit-maximizing.

60. In most legal economic analysis literature probability of liability (P) is expressed as one number. To better illustrate the argument, this article isolates that aspect of probability on which SRM decisions turn given the possibility of admission or exclusion. The traditional P is stated as a product of ($P_a \times P_j$) where P_a is the probability that an accident will happen and P_j is the probability that a manufacturer will be held liable—the probability of judgment. The P_j variable takes into account all cases whether they go to trial or not. Thus both judgments and settlements are included in the figure. While the argument presented here depends on jury misuse of SRM evidence, this does not imply that a case must go to trial for the conclusion to hold. The threat of jury misuse will strengthen a plaintiff's position so as to either force a trial or exact a higher settlement. Thus allowing admission of SRM evidence increases P_j whether a case goes to trial or results in a settlement.

61. *Ault v. Int'l Harvester Co.*, 528 P.2d 1148. In *Ault*, the metal used to manufacture a sport-utility vehicle's gearbox was changed after the plaintiff's vehicle was involved in an accident which involved a possible malfunctioning of the gearbox. A survey of SRM cases suggests that the majority of cases fit the design-change scenario. *Id.*

62. An example of the recall model is found in *Bizzle v. McKesson Corp.*, 961 F.2d 719, 719 (8th Cir. 1992). In *Bizzle*, the plaintiff's walking cane was recalled by the defendant after (and at least in part because) the cane broke when the plaintiff fell. Ultimately all canes like the plaintiff's were removed from the market and replaced with a different model. *Id.*

63. *E.g.*, James A. Henderson, Jr., *Product Liability and the Passage of Time: The Imprisonment of Corporate Rationality*, 58 N.Y.U. L. REV. 765, 767 (1983) (noting how exposure to liability affects manufacturer's behavior); Alfred W. Cortese, Jr. & Kathleen L. Blaner, *The AntiCompetitive Impact of U.S. Product Liability Laws: Are Foreign Businesses Beating Us At Our Own Game?*, 9 J. L. COMM. 167, 185-186 (1989) (noting that businesses react to liability rules by inter alia dropping products and stopping research and development).

B. The Economic Analysis

1. Simple Design-Change Model

The first illustration assumes two products (one built pre-SRM and one built post-SRM) under the design-change model. It also assumes that taking an SRM will not affect the probability of judgment. The analysis is displayed in Figure 1.

Figure 1 SRM Evidence Excluded

	Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-) ⁶⁴
I	0	1000	.1	.5	.05	50	50
I _{sr} m	0	1000	.1	.5	.05	50	50
II	0	1000	.1	.5	.05	50	50
II _{sr} m	10	1000	.07	.4	.028	28	38

TOTAL PRODUCTS NB = 1; NA = 1 ⁶⁵	TOTAL COST ⁶⁶
No SRM taken [50(I) + 50(I)]	100
SRM taken [50(I) + 38(I)]	88

In Figure 1, the data in rows I and I_{sr}m are the analysis of expected costs for the products built before an SRM is taken. Both rows appear the same under the design change model because the contemplated SRM will not alter existing products,⁶⁷ instead it will change the design of new products.⁶⁸ The data in rows II and II_{sr}m represent those products built after contemplating the SRM. In row II, the manufacturer chose not to implement the SRM. In row II_{sr}m, it was implemented.

In making the decision whether to take an SRM under the design-change model, a manufacturer must account for costs attributable to products built both before and after the contemplated

64. A manufacturer will calculate per product cost (PPC) by adding expected liability and any additional care cost.

65. The total number of products built is represented by Nb and Na -where N = number of products, b (before) = pre-SRM products, and a (after) = post-SRM products.

66. A manufacturer calculates total cost (TC) both where a SRM is taken and where no SRM is taken. The formulas are as follows. Where an SRM is not taken: PPCI(Nb) + PPCII(Na) = TC. Where SRM is taken: PPCI_{sr}m(Nb) + PPCII_{sr}m(Na) = TC_{sr}m.

67. Existing products include those products manufactured until the changed is incorporated.

68. New products include only those products yet to be built.

SRM. As Figure 3 suggests, *ceteris paribus*, from a liability standpoint it would be profit maximizing to take the SRM because doing so results in a net saving of 12. By taking care of 10, P_a is reduced from .1 to .07 because the product is made safer (less likely to cause injury) by the SRM, and P_j is reduced from .5 to .4 because with a safer product proving a defect is more difficult. The product of these variables reduces P from .05 to .028 that in turn reduces PPC and ultimately total costs. All of this benefit is attributable to the SRM. In other words, efficiency is maximized by taking the SRM.⁶⁹

2. SRM Effect On Probability Of Judgment

This section changes one assumption, namely that taking an SRM will increase the probability of judgment for the pre-SRM product. This is expressed (in Figure 2) as an increase in P_j where the SRM is taken (I_{srm}).

Figure 2 SRM Evidence Admitted

	Care	Loss	(P_a	$\times P_j$)	$=P$	Exp.Liab	(-PPC-)
I	0	1000	.1	.5	.05	50	50
I_{srm}	0	1000	.1	.75	.075	75	75
II	0	1000	.1	.5	.05	50	50
II_{srm}	10	1000	.07	.4	.028	28	38

TOTAL PRODUCTS NB = 1; NA = 1	TOTAL COST
No SRM taken [50(1) + 50(1)]	100
SRM taken [75(1) + 38(1)]	113

The analysis here is the same as in Figure 1, but the conclusions differ dramatically. Here the profit maximizing decision would be to do nothing. Taking the SRM results in a net loss of 13. If SRM evidence is admitted, there is a higher probability of judgment that in turn produces a higher expected liability and thus a higher total cost.

This occurs despite the social desirability of the SRM. The social cost argument differs because society is concerned only with the probability of accident (P_a). The probability of judgment (P_j) is irrelevant since society will pay irrespective of an adjudication of liability. Thus for the data contained in Figure 2, without the SRM

69. An efficient SRM is one that reduces total social costs. Not all SRMs are efficient.

the total social cost is 200,⁷⁰ whereas when the SRM is taken, the total social cost is only 170.⁷¹ Obviously social optimality favors taking this SRM.

Since the manufacturer can discount its expected liability (as compared with society's expected liability),⁷² its analysis will not parallel society's analysis. Given the assumptions stated above, in order to induce manufacturers to take all socially desirable SRMs, SRM evidence must be excluded from trials of pre-SRM products.⁷³

3. Multiple-Product Scenarios

This section challenges the conclusions of *Ault*.⁷⁴ While maintaining the design-change model and the assumption that P_j is increased by admission of SRM evidence, this section assumes an increased number of pre- and post-SRM products to simulate the mass producer of goods suggested by *Ault*. Figure 3 assumes 30,000 pre-SRM products and 10,000 post-SRM products. Figure 4 assumes 10,000 pre-SRM products and 30,000 post-SRM products.

70. That is P_a multiplied by the loss for products built both before and after contemplating a SRM. Thus where there is one "before" product and one "after" product, as in Figure 2, the calculation is this: $[(.1 \times 1000) + (.1 \times 1000)] = 200$.

71. The formula is the same as that noted above: $[(.1 \times 1000) + (.07 \times 1000)] = 170$.

72. The discounting is achieved through inclusion in the cost calculation a consideration of P_j . Any P_j less than one (1) will discount the manufacturer's analysis relative to the social analysis.

73. This is true given the liability rule assumed in this article. Of course, if another rule, such as manufacturer liability, prevailed, manufacturers would make all efficient SRMs. P_j would be near one (1) thus the manufacturer's analysis of efficient SRMs would parallel society's analysis. Further discussion of these ramifications are beyond the scope of this article.

74. The previous section refutes the *Ault* conclusions as applied to a manufacturer that does not produce tens of thousands of goods.

Figure 3 SRM Evidence Admitted—More Pre-SRM Products

	Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
I	0	1000	.1	.5	.05	50	50
Isrm	0	1000	.1	.75	.075	75	75
II	0	1000	.1	.5	.05	50	50
IIsrm	10	1000	.07	.4	.028	28	38

Total Products Nb = 30,000; Na = 10,000	TOTAL COST
No SRM taken [50(30,000) + 50(10,000)]	2,000,000
SRM taken [75(30,000) + 38(10,000)]	2,630,000

In Figure 3, if SRM evidence is admitted, the manufacturer will not take the SRM. If instead SRM evidence is excluded, the conclusion suggested by Figure 1 would apply to the data in Figure 3. The manufacturer would be induced to take the SRM because total costs with the SRM are 1,880,000 compared with 2,000,000 when no SRM is taken.

Figure 4 SRM Evidence Admitted—More Post-SRM Products

	Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
I	0	1000	.1	.5	.05	50	50
Isrm	0	1000	.1	.75	.075	75	75
II	0	1000	.1	.5	.05	50	50
IIsrm	10	1000	.07	.4	.028	28	38

Total Products Nb = 10,000; Na = 30,000	TOTAL COST
No SRM taken [50(10,000) + 50(30,000)]	2,000,000
SRM taken [75(10,000) + 38(30,000)]	1,890,000

Figure 4 suggests that when relatively more post-SRM products are anticipated (as compared with existing pre-SRM products), the manufacturer will take the SRM despite the risk that it will be admitted against it. This is perhaps the general idea (though not the express claim) of the *Ault* argument.

There are a few general conclusions suggested by these two figures. First, any time there are more products on the market before a contemplated SRM than what the manufacturer anticipates building in the future, the manufacturer will not be induced to

take an efficient SRM. This conclusion is implied by the combination of Figure 2, which shows that where there are equal numbers of pre- and post-SRM products, manufacturers will not be induced to take the SRM if SRM evidence is admitted and Figure 3, which shows that relatively greater numbers of pre-SRM products will magnify the number of cases where the incentive is to do nothing.

The same generalization cannot be made about the situation portrayed in Figure 4. At first glance it may appear that a relatively greater number of post-SRM products will induce the manufacturer to take care. But as Figure 5 illustrates, there must be twice the number of post-SRM products produced relative to pre-SRM products to induce the manufacturer to take care when SRM evidence is admitted.⁷⁵ This suggests that for every SRM decision there is some critical point at which manufacturing of enough post-SRM products will offset the liability cost presented by existing pre-SRM products.

Figure 5 SRM Evidence Admitted—Critical Point

	Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
I	0	1000	.1	.5	.05	50	50
I _{SRM}	0	1000	.1	.75	.075	75	75
II	0	1000	.1	.5	.05	50	50
II _{SRM}	10	1000	.07	.4	.028	28	38

Total Products Nb = 10,000; Na = 20,840	TOTAL COST
No SRM taken [50(10,000) + 50(20,840)]	1,542,000
SRM taken [75(10,000) + 38(20,840)]	1,541,920

Critically, under this scenario, the manufacturer's decision adopting an SRM will coincide with volume production decisions. If a manufacturer will not commit to a certain post-SRM volume, the SRM will not be efficient. This critical point is the essence of the difference between admitting and excluding SRM evidence. Where an SRM is admitted, some absolute number of post-SRM products must be built to make the SRM efficient. Under the assumptions stated above, where the SRM is admitted (Figure 5) a manufacturer must build almost 21,000 post-SRM products to eco-

75. This does not suggest that post-SRM products must be double the number of pre-SRM products in every case. "Twice the number" is a function of the assumptions used in this example, e.g., Pa, Pj, Loss, and Care.

nomically justify taking the SRM (i.e. reach the critical point).

Such is not the case where all SRM evidence is excluded. In that case, the manufacturer must produce only 1 post-SRM product to economically justify the SRM (See Figure 6).

Figure 6 SRM Evidence Excluded—Critical Point

	Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
I	0	1000	.1	.5	.05	50	50
I _{sr} m	0	1000	.1	.5	.05	50	50
II	0	1000	.1	.5	.05	50	50
II _{sr} m	10	1000	.07	.4	.028	28	38

Total Products Nb = 10,000; Na = 1	TOTAL COST
No SRM taken [50(10,000) + 50(1)]	500,050
SRM taken [50(10,000) + 38(1)]	500,038

The conclusion suggested by Figures 5 and 6 is that only exclusion of SRMs can ensure that the maximum number of efficient SRMs are taken. Where SRM evidence is excluded, efficient SRMs will be taken independent of the existing number of pre-SRM products or the projected number of post-SRM products. In contrast, where SRM evidence is admitted, the decision to implement an SRM is a function of how many old products exist and how many new products must be built to overcome losses. This conclusion directly contradicts *Ault*.

4. SRM Law Is Unclear⁷⁶

Up to this point the analyses have assumed that a manufacturer knows whether an SRM will be admitted against it. This assumption would hold if the manufacturer knew for certain where it would be sued or if all jurisdictions used the same rule. This sec-

76. "Unclear" means that a manufacturer has difficulty determining which jurisdictions it will be sued in and at what rate they will be sued in admit-jurisdictions versus exclude-jurisdictions. First, the manufacturer would determine the increased Pj for those jurisdictions where SRM evidence is admitted. Second, it would have to take into account the number of cases expected to be filed in admit jurisdictions (Pja) and the number expected to be filed in exclude jurisdictions (Pje) with some additional estimation for those jurisdictions where admission/exclusion is unclear (Pju) and ultimately combine these figures into a total Pj (as expressed in Figure 7) .

tion changes the assumption, assuming some jurisdictions admit the evidence and some exclude it.

The analysis is presented in Figure 7. It is essentially the same as Figure 2, except that P_j is lower than it would be if the manufacturer knew the SRM would be admitted in every case. In calculating P_j , a manufacturer would average the number of cases where the SRM will be admitted and those where it will be excluded. Figure 7 assumes that there are equal numbers of admit and exclude jurisdictions.

Figure 7 SRM Evidence Law Unclear

	Care	Loss	(Pa	x P_j)	=P	Exp.Liab	(-PPC-)
I	0	1000	.1	.5	.05	50	50
I _{SRM}	0	1000	.1	.625	.0625	62.5	62.5
II	0	1000	.1	.5	.05	50	50
II _{SRM}	10	1000	.07	.4	.028	28	38

TOTAL PRODUCTS NB = 1; NA = 1	TOTAL COST
No SRM taken [50(1) + 50(1)]	100
SRM taken [62.5(1) + 38(1)]	100.5

While the total costs are closer here, the manufacturer will not take this SRM despite its desirability (as shown in Figure 1). Here, like the scenario where all SRM evidence is admitted, manufacturers take efficient SRMs in too few cases.

Furthermore, where admission is unclear, a manufacturer must incur additional costs to make the complex averaging calculation. Because of this added cost, the manufacturer might well forego the calculation and instead assume that all jurisdictions will admit the SRM.⁷⁷ In that case, the analysis would appear the same as that in Figure 2.

77. The cost of calculating P_j would be an added cost of care which has the effect of masking identification of truly efficient SRMs. By choosing to assume that all jurisdictions will admit SRM evidence, the cost of the calculation is avoided, but true cost is not identified. It is overestimated; thus again, efficiency is not maximized.

5. Simple Recall Model

The simplest decision whether to make a recall SRM is expressed in Figure 8. This example assumes one product. It illustrates that certain investments in care can minimize total costs by reducing the probability of an accident and expected liability.

Figure 8 SRM Taken—Evidence Excluded

Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
0	1000	.1	.5	.05	50	50
10	1000	.07	.4	.028	28	38

The first row represents the product before the SRM. The second row represents it after the SRM is taken. By taking care of 10, Pa is reduced from .1 to .07 because the product is made safer by the SRM, and Pj is reduced from .5 to .4 because with a safer product proving a defect is more difficult. This in turn reduces P from .05 to .028. All of this benefit is attributable to the SRM.

6. Expanding The Recall Model

Figure 9 illustrates the analysis a manufacturer would make where it has 5000 products on the market of which 400 have been involved in accidents assuming all jurisdictions exclude SRM evidence. Figure 10 makes the same analysis assuming that the SRM evidence is admissible in the cases of the 400 products where an accident already occurred. Finally, Figure 11 presents the analysis where no SRM is taken.

Figure 9 SRM Taken —Evidence Excluded

Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
0	1000	.1	.5	.05	50	50
10	1000	.07	.4	.028	28	38

	No. of Products	Exp. Liab./Cost	Total Cost
Accident	400	500 ⁷⁸	200,000
Non-Accident	4600	38	174,800

78. This is Pj times the loss (1000). Given that the accident has already happened, Pa is irrelevant.

			374,800
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Figure 10 SRM Taken—Evidence Admitted

Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
0	1000	.1	.75	.075	75	75
10	1000	.07	.4	.028	28	38

	No. of Products	Exp. Liab./Cost	Total Cost
Accident	400	750	300,000
Non-Accident	4600	38	174,800
			474,800

Figure 11 No SRM

Care	Loss	(Pa	x Pj)	=P	Exp.Liab	(-PPC-)
0	1000	.1	.5	.05	50	50

	No. of Products	Exp. Liab./Cost	Total Cost
Accident	400	500	200,000
Non-Accident	4600	50	230,000
			430,000

As these figures indicate, a manufacturer will be inclined to take the SRM in fewer cases if SRM evidence is admitted compared with where it is excluded.⁷⁹ Figure 9 shows that the SRM is efficient, but where the SRM is admitted (Figure 10), the total cost to the manufacturer is higher than if it does not take the SRM (Figure 11). The efficient result (Figure 9) is achieved only where the SRM is excluded.

There must be a significant number of accident-products in order for the conclusion to hold.⁸⁰ It is a valid criticism that a manufacturer would likely take action long before a large number of accidents occurred, and in so doing, even where the SRM evidence is admitted, the more efficient choice would be to imple-

79. Compare Figure 10 with Figure 9.

80. Referring to Figure 10, if there are less than 338 accident products, the manufacturer will make the SRM even where SRM evidence is admitted. For example, where there are 337 accident products, the total cost is 429,944 which is less than the total cost where no SRM is taken.

ment the SRM. Significantly, however, efficiency is not maximized, and as demonstrated, where SRM evidence is admitted there are scenarios where manufacturers fail to take SRMs. It is also significant that, as is the case in the majority of jurisdictions, given that the "event" is defined as a post-accident change, there is an incentive to delay the change until after accidents have occurred.⁸¹ In contrast, where SRM evidence is excluded, no such scenario exists. Regardless of how few or how many accident products exist, a manufacturer will always be induced to take SRMs.

7. SRM Law Is Unclear

The conclusion reached in Section 4 regarding unclear law applies with equal force under the recall model. Assuming that expected liability falls to 62.5 (as in Figure 7), the total cost where a SRM is taken and evidence of it is admitted would be \$424,800.⁸² While this is less than where no SRM is taken (Figure 11), it is still higher than where SRM evidence is excluded (Figure 9). Thus, where SRM law is unclear, only excluding SRM evidence will lead to maximum efficiency.

VI. THE FUTURE OF SUBSEQUENT REMEDIAL MEASURES EXCLUSIONARY RULES

The current state of SRM law is a self-contradictory patchwork of rules that create no uniform incentives. Reform of the law is needed to establish the proper system of incentives. Reform should focus on a creating an SRM rule that uniformly excludes all evidence of changes occurring after production of the product in question.

WHY EXCLUSION?

Socially efficient SRMs produce better, safer products, breed more efficient and competitive manufacturers, and reduce total societal costs associated with product accidents. If an SRM is efficient then it should be taken. Under current liability and evidence rules, it is difficult, at best, to induce manufacturers to make all efficient SRMs. Uniform SRM rules will induce manufacturers to take rela-

81. Perhaps, for example, the likelihood of injury is reduced by increased awareness of danger spread through the media.

82. $(400 \times 625) + (4600 \times 38) = 424,800$.

tively more or fewer SRMs. As demonstrated in Part III, where SRM evidence is excluded⁸³ manufacturers are induced to take all socially efficient SRMs. The analyses presented above show that excluding all SRM evidence creates the strongest incentives to make SRMs by minimizing total costs. Therefore, SRM evidence should be uniformly excluded to ensure the best possible environment of incentives to make safer products.

WHY A UNIFORM SRM RULE?

The key to getting manufacturers to take SRMs is to create the incentives noted. As illustrated in Figure 7, where SRM rules vary from jurisdiction to jurisdiction manufacturers will take care in fewer cases than they would where all SRM evidence is excluded,⁸⁴ possibly to the same extent expected where SRM evidence is introduced by all jurisdictions. In general, a lack of uniformity dilutes the incentives created by some jurisdictions. Only exclusion of SRM evidence by all jurisdictions ensures an undiluted incentive to take all efficient SRMs. Thus, any new SRM rule should apply uniformly to all products liability cases regardless of the jurisdiction.

WHAT ABOUT EXCEPTIONS?

Exceptions to SRM rules dilute incentives in the same manner as lack of uniformity. If manufacturers interpret exceptions as likely to apply in more cases than not, they will treat the exception as the rule. Once this occurs, the incentives are lost, and relatively fewer efficient SRMs will be taken. Therefore to ensure the strongest possible system of incentives, there should be no exceptions allowed to the exclusion of SRM evidence.⁸⁵

WHAT ABOUT A NARROW DEFINITION OF SRMS?

Current law only considers a product-change as an SRM if the change is made in response to an accident. Product-changes arising from innovation or research and development are not SRMs

83. Figures 1, 6, 8, and 9.

84. Compare Figure 1 with Figure 7.

85. There is some merit to the argument that SRM evidence should be allowed to prove feasibility if controverted. This article takes no position on that view.

and evidence of those changes is generally admissible. *Ceteris paribus*, manufacturers will make fewer of these non-SRM efficient changes if evidence of these changes is admitted (Figure 2) compared to where evidence of these changes are excluded (Figure 1). Thus, like the problems of uniformity and exceptions, narrowly defining SRMs dilutes the system of incentives.

These product changes, in terms of creating better, safer products, breeding more efficient and competitive manufacturers, and reducing total societal costs associated with product accidents, cannot be distinguished from changes which current SRM law is willing to exclude. Furthermore, this type of product change likely represents a larger group of potential changes than that group currently defined as SRMs. As such, this non-SRM-change-group as a whole influences manufacturers' decisions more strongly than the relatively smaller SRM-change-group. In order to create the incentive to make non-SRM changes, they should be treated like SRM changes. Thus, evidence of these changes should also be excluded.

WHAT ABOUT THE RELEVANCY ARGUMENT?

The evidence is not truly relevant. Even if one concedes the relevance of SRM evidence, there is still reason to exclude it. Admitting the evidence serves one plaintiff. He is assisted in proving his case with this one additional piece of evidence. But as the analyses suggest, the community of manufacturers will react to this treatment by taking comparatively fewer SRMs. The net result is an environment of comparatively less-safe products.

If instead the SRM evidence is excluded, total societal benefit is increased. As the analyses demonstrated, manufacturers will take comparatively more efficient SRMs where SRM evidence is excluded. This translates into an overall safer environment.

OTHER POSSIBLE BENEFITS?

The incentives to reduce costs offered by excluding SRM evidence suggest that manufacturers will keep close watch on product accidents. The sooner a liability reducing modification is recognized, the sooner it can be implemented and have a cost (of liability) cutting effect.

Exclusion is also cheaper than a rule that admits SRM evidence. Under an admission regime, courts must hear more evi-

dence; judges must warn juries against misuse; and litigants must argue over the interpretations of SRMs. This costs time and money for both courts and litigants.

VII. CONCLUSION

SRM law presently exists as a confusing array of sometimes - contradictory incentives. The near future likely holds more of the same for SRM law, incremental change and case law interpreting the ambiguous phrases that will continue the lack of uniformity that prevails today. Hopefully there will be strides towards mustering hard evidence to support or refute the prevailing arguments. There are at least even odds that the opportunity for sweeping changes could be made to products liability law on a national scale. If so, evidence exists that manufacturers are rational economic actors that are aware of the law and make decisions in light of it. Thus, the potential for encouraging product improvements is ripe for exploitation. A uniform rule of exclusion which contemplates all product changes and which is not subject to exception will induce manufacturers to take the greatest number of efficient product improvements. At the dawn of a new century, SRM law is poised for a sweeping change.

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