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Low Probability/High Consequence
Events: Dilemmas of Damage
Compensation

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LOW PROBABILITY/HIGH CONSEQUENCE EVENTS: DILEMMAS OF DAMAGE COMPENSATION

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INTRODUCTION

This year's Clifford Symposium topic is a particularly daunting one: *The Challenge of 2020: Preparing a Civil Justice Reform Agenda for the Coming Decade*. It requires us to imagine a world that does not now exist and to anticipate social conditions and salient issues a dozen years hence. We could be living in a world at war or at peace; one in which the United States economy has rebounded and is again the strongest in the world or one in which the United States remains in the economic doldrums for years. Our social insurance schemes could be the same, or we might have universal health insurance, a reform that would alter radically both the need for tort compensation and the way tort litigation is constructed. In short, systems must be designed for the societies in which they are found, and not knowing what society will look like in the year 2020, setting a reform agenda requires considerable guess work.

But if everyone's task is daunting, mine is particularly so, for I am supposed to discuss not only how the tort system will prepare itself to confront problems arising twelve years in the future, but also how the tort system will address those problems that are hardest to anticipate—very low probability/very high consequence events. Indeed, so speculative is my topic that it barely fits into the symposium. Hence, I hope you will bear with me if what I write is more speculative than the other symposium papers.

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While it is impossible to know exactly what problems will confront the tort system in the year 2020, much less those very low probability/very high consequence events that will occur, we can be sure some such events will happen if for no other reason than that we have had recent experience with several of them. Four stand out: the escape of radiation from Three Mile Island, the Exxon Valdez oil spill, the attacks of September 11, 2001, and the flooding of New Orleans.¹ Before turning to these events, however, and before trying to imagine how the tort system might be reformed—if it can or even should be reformed—to deal with such events, we should first consider the conditions that make a tort system work well.²

II. ORDINARY TORTS

First, those who tortiously cause injury to others must be able to pay for the harm caused; otherwise, the tort remedy is an empty one. Second, transaction costs should be low. If they are not, then considerable money will be spent beyond what is needed to compensate for injuries. Expenditures will impoverish defendants beyond the costs of the harm they caused, or awards will undercompensate plaintiffs, or both. One implication is that the system works best when liability is easiest to determine, for in these circumstances obligations are clear and little money need be spent establishing who owes what to whom. Third, the injury causing behavior should

¹ The last two events were, however, predictable in an actuarial sense, and maybe the problem at Three Mile Island was actuarially predictable as well. *See generally* CHARLES PERROW, *NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES* (1984).

² The discussion below applies only to unintentional harms of the kind that give rise to suits for negligence or strict liability. Recovery for intentional torts and dignitary harms is beyond the scope of this Article.

not be entirely accidental or, to the extent it is, the accident should have been made more probable by the way in which a situation was structured. This requirement may seem counterintuitive because we tend to think of tort law as providing remedies for accidentally caused harms, but this condition must exist for a major justification for tort law—the deterrence of harm—to be realized. If harm-causing acts were random, inevitable occurrences and systems could not be designed or care taken to reduce the likelihood of harm, then although tort law could still fill its loss shifting function, it could not reduce the probability of future harmful behavior. Hence, a major justification for allowing tort recovery, and for systems of strict liability in particular, would be lost.

Finally, there should be some moral blameworthiness on the part of the tortfeasor, and ideally this blameworthiness should be more or less commensurate with the harm caused. Negligence liability requires some violation of a duty to act carefully, but the moral shortcoming associated with violating that duty can range from minimal, as when a surgeon's knife slips during a delicate operation, to substantial, as when a wrong leg is amputated because routine checks were not made. The perceived fairness of compensation depends not just on the degree of harm done but also on assessments of the culpability of the negligent behavior. In the extreme case, the line between the civil and criminal is breached, and punitive damages may be awarded or a matter may be converted from tort to crime.

There is perhaps no type of injury that is perfectly suited to tort compensation if suitability requires that these four conditions be always met, but some kinds of cases fit the model of when tort liability is most appropriate better than others. An example that comes close is the minimal to moderately serious auto accident. Because almost every driver is insured, there is a fund to compensate those who are injured. Transaction costs are frequently low because

simple rules-of-thumb can be applied to determine liability when the stakes are not very high.³ Although the ubiquity of insurance may dampen the deterrent effects of tort liability, the effects of accident involvement on insurance rates provide another route for deterrence to affect decision making. Finally, those responsible for accidents typically have failed in well-known duties and often their way of failing—speeding, running a stop sign, talking on a cell phone, etc.—can be known precisely. Insurance, however, interferes with the morality goal by transforming the experience of being held liable from a responsibility for a moral failing to an unavoidable cost of choosing to drive.

This analysis applies only to run of the mill cases. Other cases pose complicated legal and factual problems, and transaction costs can be enormous. Indeed, study after study, beginning with the work of Alfred Conard⁴ in the 1960s, has shown that victims in the least serious auto accidents tend to be overcompensated while those in the most serious accidents are substantially undercompensated after lawyers' fees and other transaction costs have been paid.⁵

³ See generally H. LAURENCE ROSS, *SETTLED OUT OF COURT: THE SOCIAL PROCESS OF INSURANCE CLAIMS ADJUSTMENT* (2d rev. ed. 1980).

⁴ See generally ALFRED F. CONARD ET AL., *AUTOMOBILE ACCIDENT COSTS AND PAYMENTS: STUDIES IN THE ECONOMICS OF INJURY REPARATION* (1964).

⁵ See generally GUIDO CALABRESI, *THE COST OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* (1970); see also Guido Calabresi, *First Party, Third Party, and Product Liability Systems: Can Economic Analysis of Law Tell Us Anything About Them?*, 69 *IOWA L. REV.* 833 (1984) (examining various types of auto insurance regimes and their relative economic incentives).

Even in the less serious cases, greater efficiency may often be achieved by avoiding the tort system entirely. Hence the rise of no-fault auto insurance.⁶

Another area where the goals of tort law seem relatively close to realization is one where tort liability has been abandoned: worker's compensation. Requiring companies to either have insurance or show a capacity to self-insure guarantees that there will be a fund to compensate injuries. By making compensation almost automatic in most circumstances, transaction costs are minimized. Deterrence exists through experientially-rated or self-insurance systems that become more expensive as a company's injury costs rise. Prevention is enhanced because data is collected on all injuries that occur in a plant, location, or process, making it easier to spot situations where the organization of work contributes to high accident rates. Unlike the tort system which at least in theory encourages care on the part of potential victims because contributory negligence thwarts recovery, compensation schemes do little to reduce injuries through their effects on victim behavior. Moreover, the moral element is almost completely lacking. Organizing work in ways that increase rather than decrease injury risk is not wrong in the sense of violating a duty of care that a company owes its workers; it is just bad business, and then only in situations where the cost of promoting workplace safety is less than the cost of

⁶ See generally ROBERT E. KEETON & JEFFREY O'CONNELL, BASIC PROTECTION FOR THE TRAFFIC VICTIM: A BLUEPRINT FOR REFORMING AUTOMOBILE INSURANCE (1965) (laying out the concepts of no-fault insurance that came to be known as the "Keeton-O'Connell Plan"). See also Jeffrey O'Connell, *An Alternative to Abandoning Tort Liability: Elective No-Fault Insurance for Many Kinds of Injuries*, 60 MINN. L. REV. 501 (1976) (arguing in favor of a no-fault liability system as a means of reducing systemic tort costs).

compensating for the “excess” accidents that occur. Nevertheless, worker’s compensation is generally regarded as far superior to the system of negligence liability it replaced, where transaction costs were high; defenses like assumption of the risk and contributory negligence meant that many injured workers went uncompensated, and businesses had little idea how much they would have to pay out in a year for workplace injuries.⁷ For these and other reasons, the legal treatment of workplace injuries before worker’s compensation schemes, did not come close to meeting our posited requisites for tort liability. Thus, it is not surprising that the movement towards worker’s compensation schemes triumphed in all states.

III. LOW PROBABILITY/HIGH CONSEQUENCE INCIDENTS

The point of this excursion into the world of ordinary torts is that if tort compensation schemes are far from perfect in accident situations that gave rise to and in some measure still best fit the desiderata for tort liability, the fit is likely to be much poorer when harm is caused by low probability/high consequence events that, if we were starting from scratch, we might never consider compensating through tort liability. In these kinds of cases, it is only by chance that any of the requisites for tort liability will be met. Damages from high consequence events may be so high that no one, apart from government, will have pockets deep enough to compensate all victims. Transaction costs are likely to be huge, given the difficulties of assembling plaintiffs and defendants for litigation, the vast amount of material that may have to be discovered and reviewed to determine responsibility, and stakes so high that parties will have strong incentives

⁷ See Lawrence M. Friedman & Jack Ladinsky, *Social Change and the Law of Industrial Accidents*, 67 COLUM. L. REV. 50, 69–72 (1967) (describing the emergence of the modern worker’s compensation system).

to invest heavily in every phase of the action. The Exxon Valdez litigation, for example, threatened to be another *Jarndyce v. Jarndyce*⁸ before it was resolved, more than fifteen years after the accident.⁹ The cost of Exxon's defense in this case is thought to be in the hundreds of millions of dollars,¹⁰ but with a punitive damage award of five billion dollars to contest, even

⁸ This famously interminable but fictional legal dispute over an inheritance forms the backdrop for one of Charles Dickens's greatest novels. See CHARLES DICKENS, *BLEAK HOUSE* 16 (Nicola Bradbury ed., Penguin Books 2003) (1853) ("This scarecrow of a suit has, in course of time, become so complicated, that no man alive knows what it means.").

⁹ *Exxon Shipping Co. v. Baker*, 128 S. Ct. 2605 (2008).

¹⁰ These included commissioning numerous studies to challenge the institution of punitive damages as well as the capacity of juries to fairly award them. See, e.g., Cass R. Sunstein et al., *Assessing Punitive Damages (with Notes on Cognition and Valuation in Law)*, 107 *YALE L.J.* 2071 (1998) (assessing sources of arbitrariness and unpredictability in punitive damage awards); see also Reid Hastie & W. Kip Viscusi, *What Juries Can't Do Well: The Jury's Performance as a Risk Manager*, 40 *ARIZ. L. REV.* 901, 904–21 (1998) (reporting empirical research suggesting judges are less prone to certain cognitive biases than juries). But see Richard Lempert, *Juries, Hindsight, and Punitive Damage Awards: Failures of a Social Science Case for Change*, 48 *DEPAUL L. REV.* 867 (1999) (questioning the quality and the interpretation of the empirical evidence used in Hastie & Viscusi's study).

these expenditures made good business sense. In the lower courts, the damages were cut in half, and the Supreme Court reduced them by another eighty percent.¹¹

Deterrence effects in these cases are likely to be minimal because the ways in which low probability events cause their harms are difficult to anticipate, and a particular low probability/high consequence harm might not be expected to occur in the same way again, if it occurs at all. Indeed, as is arguably the case with the nuclear generation of electricity after Chernobyl and Three Mile Island, what may be deterred is not careless or reckless behavior but rather an activity that has considerable value and only a very low chance of causing great harm. Finally, people need financial help following serious harm whether or not there is sufficient evidence of negligence to justify it.

As for the moral dimension, in situations like the 9/11 assault on the World Trade Center and the Pentagon, even when negligence arguably exacerbated harm, the damages for which recovery is sought may seem far out of proportion to the moral failings of actors, like the airlines and their screeners, whom plaintiffs seek to hold accountable. As deplorable and devastating as the 9/11 assault was, it is hard to fault the inspectors at the various airports who let the men who would later hijack the planes board with box cutters in their carry-on luggage. Small blades like these items were not forbidden, and few would have anticipated they would be used to take over planes. Moreover, while an inspector should have perhaps become suspicious when five different people had the same sharp object in their luggage—if the sharp object seemed the same

¹¹ See *Exxon Shipping Co.*, 128 S. Ct. at 2634 (holding that under the Clean Water Act the maximum amount of punitive damages awarded could not exceed the jury's compensatory damages award of \$507.5 million, ensuring a 1:1 ratio of punitive to compensatory damages).

in different x-ray views—it is likely that different hijackers had their belongings viewed by different inspectors. It is even harder to fault the airplane flight crews for acceding to the hijackers' demands because until these incidents no airplane hijackers had tried to crash planes they took over. In acceding to the hijackers' demands (until it became too late), the planes' crews were following an established protocol to minimize the loss of life.

In the Exxon Valdez case the captain's negligence in drinking while in command of a ship was clear, and Exxon's negligence in allowing that captain to command a tanker knowing his history may also seem blameworthy. Nevertheless, obliging Exxon to pay billions of dollars in compensatory and punitive damages is arguably out of all proportion to the company's, if not the captain's, moral failings, regardless of whether it is proportionate to the harm caused.

In addition, the United States government was deeply involved—in the sense of having considerable causal responsibility—in three of the incidents discussed here. In New Orleans, decisions by the Army Corps of Engineers were a major contributing factor to the collapse of the levees, and the federal government added substantially to the harms people suffered by the many shortcomings in its evacuation and recovery activities. The 9/11 hijackings might have been avoided had the FBI acted on urgent messages from its field agents about possible plots, and the government regulated what items were and were not permitted on planes. It also, no doubt, had the lead role in establishing the protocols plane crews should follow during an attempted hijacking. Three Mile Island involved a tightly regulated industry that looked to the government to set safety standards, and government regulators had the responsibility to ensure that its standards were followed. Even the Exxon Valdez incident involved a regulated activity, although it does not seem that a failure of the regulatory process in standard setting or surveillance was responsible for what happened.

Many of the governmental activities that contributed to these disasters were not, however, the kind that give rise to governmental liability as provided for in the Federal Torts Claims Act¹² and other statutes.¹³ Rather, they all involved at least some activities that were uniquely governmental or highly discretionary, for which the government has not consented to be sued. Thus, even though the government has the deep pockets needed to compensate people for major disasters, and even though in some of the four instances we are examining the government, through its agents, seems morally at fault in much the same way ordinary corporate tortfeasors are at fault, many of those harmed by governmental decisions and actions have limited or no remedies available through the tort system.

Because I lack the imagination or do not dare to envision the next catastrophic events to harm the nation, the remainder of this article will continue the focus on Three Mile Island, the Exxon Valdez oil spill, the 9/11 attacks, and Hurricane Katrina as exemplars of how the tort system does and does not work when faced with low probability/high consequence events. The conclusion will discuss lessons that may be drawn from these examples.

¹² 28 U.S.C. § 1346(b) (2000).

¹³ *See generally* The Price-Anderson Amendments Act, 42 U.S.C. § 2210 (2000) (laying out the indemnification and liability limitations for nuclear reactor facilities); *see also* 33 U.S.C. § 702(c) (2000) (a flood control statute which provides that, with certain exceptions, “[n]o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place”).

A. *Three Mile Island*

Responses to the four low probability/high impact disasters that we are using as examples have been quite different from the standpoint of tort compensation. In the case of the radiation leak from Three Mile Island, negligence appeared clear, but the prospect of harm from the leaked radiation was unclear. The harm, most likely in the form of an increased incidence of cancer, would take years to manifest itself. Given a manifestation lag of perhaps decades and the many possible causes of cancer, most plaintiffs would find it impossible to show by the preponderance of the evidence that the radiation exposure caused their disease. Negligence, however, was irrelevant to compensation from this leak. Under the Price-Anderson Act,¹⁴ first passed in 1957 and renewed several times since, recovery for nuclear accidents is on a no-fault basis, with a cap on total liability and no possibility of punitive damages.

Following the Three Mile Island radiation leak, about seventy million dollars was paid out, a portion as voluntary aid or settlements and some in response to law suits. These payments included the establishment of a five-million-dollar fund to be used for public health measures in the area most exposed to leaked radiation rather than for individual injuries¹⁵ and a twenty-million-dollar fund to aid businesses within the twenty-five-mile region surrounding the power

¹⁴ Pub. L. No. 85-256, 71 Stat. 576 (1957).

¹⁵ The most likely physical injuries of any severity would be radiation-induced DNA damage that many years later would manifest itself as a cancer. These injuries were unknown at the time compensation was paid, and tracing specific later emerging cancers in the population exposed to the Three Mile Island radiation leak to the leak, as opposed to other cancer causes, would almost certainly be impossible.

plant. These payments came entirely from the utility's primary insurer rather than from the special fund that Price-Anderson contemplates.¹⁶

Price-Anderson establishes an interesting scheme to fund recoveries—one that might potentially be adapted to other low probability/high consequence risks. To oversimplify a bit,¹⁷ it requires the operators of all nuclear reactors to self-insure up to the amount of insurance available for purchase on the private market, currently \$300 million. Then it requires all companies with nuclear reactors to collectively insure against damage from accidents at any plant that exceeds the \$300 million covered by a plant's primary insurance. Currently, the contribution per reactor is close to ninety-six million dollars, and the total fund created by this scheme is about ten billion dollars. Complementing these funding arrangements are procedural rules that (a) require that suits for damages due to covered activities be heard in federal court, (b) provide that if causality is proved there is no need to prove faulty behavior by the company whose activities led to the harm, (c) bar punitive damages, and (d) limit the amount of corporate liability to the mandated primary insurance coverage and the collective fund contribution. Most interesting is that, although I have spoken of the collective fund contribution assessed against each reactor as an insurance payment, for in its risk spreading it is very much like one, unlike

¹⁶ AMERICAN NUCLEAR SOCIETY, PRICE-ANDERSON ACT: BACKGROUND FOR POSITION STATEMENT 543 (2005).

¹⁷ The amounts in the discussion that follows apply only to the largest category of nuclear reactors. Certain, lower-powered nuclear reactors must self-insure and contribute to the general Price-Anderson fund at lower levels as must certain other kinds of businesses, such as transporters and waste disposal facilities that are also covered by and protected under the Act.

ordinary insurance this payment need not be made unless an accident occurs and the costs of accident-associated compensation exceed a company's primary insurance coverage, something that has not yet happened. Thus, while ninety-six million dollars sounds like a lot of money for liability protection, to date no company has had to pay to the common fund because no accident requiring payment from the fund has occurred.

In one way this is a clever solution to the problem of the low probability/high consequence event. Because of the great uncertainty surrounding both the likelihood and costs of a serious nuclear accident, it is difficult, if not impossible, to actuarially evaluate expected insurance payouts; hence, setting appropriate insurance rates is more guesswork than science, and beyond a certain level, which today appears to be about \$300 million, insurers are unwilling to risk the possibility of catastrophic liability. But the solution is also fraught with problems. The one most frequently pointed out and which most troubles consumer protection groups is that liability is capped far below the damages that a more serious reactor catastrophe, like that at Chernobyl, might inflict.¹⁸ Thus, in the face of a truly catastrophic accident, the compensation goal of tort law would not be met unless Congress chose to allocate additional funds to pay for the injuries of those harmed.

¹⁸ High end estimates of the damages caused by Chernobyl range from \$200 billion to \$500 billion. PUBLIC CITIZEN, PRICE-ANDERSON ACT: THE BILLION DOLLAR BAILOUT FOR NUCLEAR POWER MISHAPS 2 (2004). Even if these damage estimates are far too high, a similar accident in the United States might well reach this level because of the higher property values that exist here, medical care costs that are far greater than in Russia and the high monetary value we place on negligently taken human lives or negligently caused cancers and serious injuries.

In the case of small harms, like those associated with Three Mile Island, Price-Anderson seems to have worked well. It reduced transaction costs while quickly paying documented damages. The situation might be different should catastrophic losses occur. While no-fault compensation should, in theory, limit litigation and reduce transaction costs, contests among those harmed to get larger pieces of an insufficient pie may lead to considerable litigation and related expenses.

The possible compensation shortcomings of the Price-Anderson solution are closely related to another oft-cited fault, one which might be exacerbated rather than cured if Congress can be expected to pay for nuclear accident costs beyond what the Price-Anderson fund can cover. Because the fund and hence the financial obligations placed on the nuclear industry fall far short of what full compensation for accidents might require, the accident deterrence function of tort law is undermined. If a reactor owner knows that even if a loss of containment causes tens of billions of dollars in damages, his liability will be capped at under \$100 million, he will, in theory, have insufficient incentive to take care. If the total damages are under ten billion dollars, an insufficiently careful company may not even suffer a great public relations loss, for the combined fund will pay all justified claims. We have in the past year, for example, learned of nuclear power plant security guards who slept while on duty.¹⁹ If the facilities and contractors employing these guards knew that they faced catastrophic rather than relatively modest costs should terrorists blow up a reactor, would they perhaps have better supervised their guards or

¹⁹ Steven Mufson, *Video of Sleeping Guards Shakes Nuclear Industry*, WASH. POST, Jan. 4, 2008, at A01; H. Josef Hebert, *NRC Accused of Ignoring Sleeping Guards*, USA TODAY, Sept. 28, 2007, available at http://www.usatoday.com/news/nation/2007-09-28-nrc-guards_N.htm

maybe have paid their guards more so that they could employ top people? Economic theory suggests increased caution, and a willingness to pay what it took to employ quality help would be more likely.

A diminished incentive to take care is likely whenever the costs of eventuating risks are socialized, as they are in all insurance. But insurance schemes have ways of restoring a portion of this incentive through experiential rating. Indeed, the prospect of increased insurance costs may be more salient than the likely harm of accidents in causing drivers to take care. Insurance premiums also provide information to insureds about their evaluated risks. Yet even though the apparent risk of a nuclear reactor disaster increased dramatically after 9/11, feedback to those operating nuclear reactors through insurance premium adjustments could not have been great, if it existed at all.²⁰

Finally, the moral dimension to tort liability is largely gutted by the provisions of Price-Anderson. Fault plays no part in accident compensation decisions, and punitive damages are barred.²¹ This means that no matter how far short of due care a reactor operator falls, no price will be paid for it. An operator focused on the near-term bottom line might decide that it would rather pay a contractor less money for security services and risk having inadequately trained,

²⁰ I have been unable to find out if premiums for the compulsory primary insurance that Price-Anderson requires increased dramatically after 9/11, but the amount of primary coverage available increased rather than dropped which, if it conveyed any message, would suggest that risks became less of a concern. The implausibility of this conclusion brings into question how private and immune from political influence this so-called private market is.

²¹ 42 U.S.C § 2210(s) (2000).

sleepy guards than pay more money for well-trained, alert guards. The economic calculus is simple. Alert guards command higher salaries than sleepy ones. If sleeping guards allow terrorists to successfully attack a reactor, the monetary price is no greater than it would be in the case of an unavoidable accident.

Contributory negligence is also removed from the recovery scheme, in theory reducing victims' incentives to avoid exacerbating the harms done them. An individual who was seriously contaminated because he intentionally returned to a radioactive zone to retrieve personal property would be entitled to the same award as a person similarly injured because she could not escape the initial radiation release. Finally, good plant operators are not rewarded. Nuclear reactor companies that invested heavily in plant security and safety will be on the hook for the same amount as the plant operators who cut the corners that led to disaster.

Price-Anderson is the most elaborate scheme we have for dealing with low probability/high consequence, and, hence, difficult to foresee, disasters. It is clearly far from ideal in some respects, but, for all its deficiencies, it may offer more than some of the other schemes used to compensate for the disasters we are considering. Or perhaps it only seems better given the applications we have seen so far. Fortunately, the United States has never had to confront a nuclear disaster on the scale of Chernobyl, so we do not know how the Price-Anderson solution would look in a situation that triggered its special mechanisms. Nor do we know whether Price-Anderson's liability limits created disincentives to investments in safety and, thus, contributed to the catastrophe at Three Mile Island.²²

²² Because nuclear power plants and other reactors are highly regulated, one might argue that the incentives toward safety that the prospect of tort liability brings are not needed; government-

B. Exxon Valdez

The Exxon Valdez case illustrates another way of resolving issues growing out of low probability/high consequence accidents²³—letting the legal system take its course. If Exxon Valdez is the model of how the “litigation as usual” model works, there are at least as many problems with this solution as there are with the Price-Anderson Act. Determining liability in the Exxon Valdez case was not a problem. Although Exxon denied the kind of reckless behavior that would justify punitive damages, it admitted from the outset that the spill and most of the subsequent damage were due to its negligence and the negligence of its agent. That agent, the Exxon Valdez’s captain, was a known, albeit presumably recovered, alcoholic who had been

imposed behavior will ensure adequate investments in safety. In theory the argument works, but in practice we see instance after instance where regulatory protection breaks down either because of a regulator’s organizational and individual shortcomings or because political ideology trumps safety concerns in setting the level of regulation. The subprime mortgage debacle is the most recent example.

²³ One can argue that an oil spill from a tanker is not a low probability event as spills occur with some frequency, but spills with the consequences of the Exxon Valdez oil spill are rare events and not easily anticipated. (Between 1976 and 1991 there were at least nineteen oil spills of greater volume than the Exxon Valdez. The economic and ecological consequences of the Exxon Valdez spill were extraordinarily high because the spill occurred in a valuable fishery and a pristine natural environment.)

drinking heavily the night of the accident.²⁴ Indeed, the day after the accident the captain was fired.

Even with negligence admitted, transaction costs in this case were huge. The case saw more than 1000 depositions taken over 2500 deposition days, including 200 expert witnesses deposed over 450 days.²⁵ There were more than 7500 filings, 1000 motions, 550 discovery adjudications and 370 numbered orders.²⁶ More than sixty law firms had a role in the punitive damage trial growing out of the incident.²⁷ The trial involved 155 witnesses, 36 experts, 453 plaintiff exhibits, and 656 defendant exhibits.²⁸ An Alaska state court and the federal district court engaged in a tug of war over jurisdiction, and the Ninth Circuit heard aspects of the case on a number of occasions.²⁹ The Supreme Court denied *certiorari* in 2000 before finally hearing the case in 2008.³⁰ It has been estimated, that as of 1999, Exxon had spent \$300 million in its

²⁴ Eleven hours after the accident the Exxon Valdez's captain's blood alcohol was above .06. It has been estimated that at the time of the accident it was .24. The legal limit is .04. See 33 C.F.R. § 95.020 (2007).

²⁵ William B. Hirsch, *The Exxon Valdez Litigation Justice Delayed: Seven Years Later and No End in Sight*, available at http://www.lieffcabraser.com/wbh_exxart.htm (2006).

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ Exxon Shipping Co. v. Baker, 128 S. Ct. 2605, 2613–15 (2008).

³⁰ See *supra* note 29 for the full history.

defense,³¹ and only the plaintiffs' lawyers know what costs have been advanced on their side and how much lawyer time has been expended. What is known is that the plaintiffs' attorneys were supposed to receive 22.4% of amounts eventually paid, another substantial transaction cost.

Delay compounded problems. When in 1994 the punitive damage jury handed down its verdict, as Brian O'Neill, the plaintiffs' lead counsel, was hugging his three-year-old son, one of the lawyer's for Exxon leaned over and commented, "He'll be in college before you get any of that money."³² The Exxon lawyer's forecast was close to the mark. Brian O'Neill's son may well have started college before any of the money finally awarded was apportioned.

Some of Exxon's appeals were clearly well advised and legally justified, as Exxon succeeded first in having the punitive damage award cut in half by the Ninth Circuit and then saw it cut another eighty percent by the United States Supreme Court. But much of the delay

³¹ Robert E. Jenkins & Jill W. Kastner, Comment, *Running Aground in a Sea of Complex Litigation: A Case Comment on the Exxon Valdez Litigation*, 18 UCLA J. ENVTL. L. & POL'Y 151 (2000). Much of the discussion that follows is based on this detailed and balanced discussion of the course of this litigation by two law students. It is interesting to contrast this discussion, and especially its treatment of the rulings of Judge Holland, who tried the federal case, with the similar portrayal of the case on the plaintiff's website. See Faegre & Benson LLP, Exxon Valdez Oil Spill Litigation Update, <http://www.faegre.com/showarticle.aspx?Show=2881> (last visited Feb. 8, 2009). There is considerable consistency in the events and the rulings each reports, but the authors' interpretations of the appropriateness of the Judge's rulings and of Exxon's actions are in many places strikingly different.

³² Jenkins & Kastner, *supra* note 31, at 192.

attributable to Exxon's appeals and other tactics appears frivolous or worse. For example, Exxon appealed the trial judge's decision to allow a juror to remain on the jury after she first stated that she wanted to be relieved, then said that she did not and finally said that she did.³³ But the reason the juror first changed her mind and said she would stay was because, she told the judge, she was the only juror who did not think punitive damages were justified.³⁴ Exxon could hardly have been prejudiced by her remaining seated despite her final desire to be excused.³⁵ Further delay was attributable to a secret agreement that Exxon made in settling with some Seattle canneries.³⁶ The settlement included a commitment by the canneries to claim a share of any punitive damage award despite their private settlement and to then refund almost all of what they received to Exxon.³⁷ The details of this settlement were initially hidden from the plaintiffs and the judge.³⁸ Compounding this breach of candor and arguably of ethics, Exxon had the temerity to argue to the jury, presumably as evidence of its good faith, that it had voluntarily settled with the canneries asking nothing in return.³⁹

One may wonder why Exxon would seek delay, for their litigation costs were increased by their many motions and appeals. One suggestion is that the interest Exxon earned from

³³ *Id.* at 195–200.

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* at 200–204.

³⁷ *Id.*

³⁸ Jenkins & Kastner, *supra* note 31, at 200–201.

³⁹ *Id.* at 204.

retaining and investing the five billion dollars far exceeded the costs of delay, even given Exxon's obligation to pay statutory interest from the date the judgment was entered.⁴⁰ So, taking advantage of all possible avenues for delay and appeal paid off financially for Exxon, regardless of the likelihood that an action would succeed.⁴¹ But, for the plaintiffs, delay meant that they

⁴⁰ *See generally* Opinion, *Slow Justice*, ANCHORAGE DAILY NEWS, June 28, 2008, at B4 (stating that Exxon earned between twelve and twenty-six percent interest on the money but will only have to pay 5.9% on the judgment).

⁴¹ Although losing litigants are often obligated to escrow enough money to cover a judgment pending an appeal and so do not benefit from their ability to invest the judgment money, the trial judge was confident that Exxon could pay off the judgment (a confidence Exxon fortified with a guarantee arrangement with Bank of America) and so did not impose any escrow requirement. Apparently, the judge did not consider the incentives for delay that allowing Exxon to retain and invest the amount awarded would provide. It should be noted that Exxon's all out assault on the verdict led it to spend money even when returns from delay could not be anticipated. Thus, it commissioned numerous social science studies by leading scholars to argue against the institution of punitive damages in general and a jury's capacity to fairly award them in particular. *See supra* note 10; Reid Hastie, David A. Schkade & John W. Payne, *Juror Judgments in Civil Cases: Effects of Plaintiffs Requests and Plaintiffs Identity on Punitive Damage Awards*, 23 LAW & HUM. BEHAV. 445 (1999); Daniel Kahneman, David Schkade & Cass R. Sunstein, *Shared Outrage and Erratic Awards: The Psychology of Punitive Damages*, 16 J. RISK & UNCERTAINTY 49 (1998); David Schkade, Cass R. Sunstein & Daniel Kahneman, *Deliberating About Dollars: The Severity Shift*, 100 COLUM. L. REV. 1139 (2000); Cass R. Sunstein, Daniel

and their law firms were for years unable to benefit from the jury award, even though it was ultimately partially upheld on appeal. Moreover, the appeals and delay imposed substantial costs on the judicial system through its need to deal with Exxon's many motions and claims of error.

Turning from transaction costs and delay to issues of compensation, the situation gets even fuzzier. Regardless of the outcome of the punitive damages suit, Exxon has paid out substantial sums as a result of the accident. Exxon's clean-up costs appear to have been in excess of three billion dollars; the State of Alaska received more than \$900 million as general compensation for environmental damage, an Exxon-created settlement fund paid out more than \$300 million dollars, and a no-fault compensation fund primarily aimed at compensation for pipeline leaks paid out its single event maximum of \$100 million.⁴² Exxon's net outlay, while

Kahneman & David Schkade, *Assessing Punitive Damages*, 107 YALE L.J. 2071 (1998); W. Kip Viscusi, *The Challenge of Punitive Damages Mathematics*, 30 J. LEGAL STUD. 313 (2001); W. Kip Viscusi, *Jurors, Judges, and the Mistreatment of Risk by the Courts*, 30 J. LEGAL STUD. 107 (2001); W. Kip Viscusi, *Why There is No Defense of Punitive Damages*, 87 GEO. L.J. 381 (1998). In addition, the Exxon legal team aggressively sought to overcome guarantees of confidentiality that a sociologist doing research on the Exxon Valdez disaster provided his subjects in an NSF-funded survey in Alaska. J. Steven Picou, *Compelled Disclosure of Scholarly Research: Some Comments on "High Stakes Litigation,"* LAW & CONTEMP. PROBS. Summer 1996, at 149, 151–53.

⁴² In addition, the Alyeska Pipeline Service Company, a seven-member consortium of oil companies, including Exxon, that runs the trans-Alaska pipeline, paid out about ninety-eight

not as much as these figures indicate because of insurance coverage and the fact that many of its costs were tax deductible, was still substantial. But even these hefty payouts may not have fully compensated for the harm done. Moreover, many of those harmed received little or no compensation. Conversely, if the initial punitive damages award had been sustained, some plaintiffs might have received a financial windfall.⁴³

Despite the amount Exxon invested in clean-up, considerable evidence of the oil spill remains.⁴⁴ It is doubtful that any clean-up effort, however much it cost, could have removed all traces of the spill. Moreover, the court's decision on the relevant law ensured that many harms would not be compensated. The federal court overruled state court rulings and decided that the oil spill was a maritime tort and that the cases of almost all plaintiffs were governed by federal maritime law.⁴⁵ In particular, this meant that the rule of *Robins Dry Dock* applied.⁴⁶ *Robins Dry Dock* limits tort recoveries to economic losses, but, with the exception of fishermen, allows recovery only to those who have suffered physical harm to themselves or their property.

million dollars as compensation for deficiencies in its clean-up activities. *In re Exxon Valdez*, No. A89-0095-CV (HRH), 1993 WL 64910, at *1–2 (D. Alaska Dec. 8, 1993).

⁴³ Carrie Tait, *Spillionaires*, FIN. POST, Aug. 30, 2008, available at http://www.financialpost.com/most_popular/story.html?id=756805.

⁴⁴ See, e.g., Felicity Barringer, *\$92 Million More Sought for Exxon Valdez Cleanup*, N.Y. TIMES, June 2, 2006, at A14 (discussing government invocation of settlement clause requiring additional funds from Exxon for “stubborn patches of oil” that still remain in Prince William Sound).

⁴⁵ *Exxon Shipping Co. v. Baker*, 128 S. Ct. 2605, 2626 (2008).

⁴⁶ *Robins Dry Dock & Repair Co. v. Flint*, 275 U.S. 303 (1927).

Moreover, in oil spill cases courts usually rule that to be compensable harms must be directly, rather than indirectly, attributable to the spill.⁴⁷ Non-economic harms are thus not compensable, although there is evidence that many Alaskan families suffered stress due to loss of employment as a consequence of the spill. Similarly, Native Alaskans' claims of cultural harm were ruled non-compensable. In addition, not all directly-related, demonstrable economic harms are compensable under *Robins*.⁴⁸

Thus, while the Alaskan District Court allowed fisherman to recover for their lost income, those merchants who purchase the fish from the boats and process and resell them were found to have suffered no compensable harms because they are not fisherman and suffered no direct physical harm from the spill.⁴⁹ Likewise, a California trial court dismissed the claims of a motorist group that complained that the price of gas in California went up twenty cents a gallon as a result of the Exxon Valdez oil spill. This latter dismissal may appear intuitively right, but if the claim of the motorist group is correct, a huge uncompensated cost was imposed on all California drivers, and some of it may have found its way into Exxon's pocket because of the higher price it could charge for gas. The settlement with Alaska was intended to compensate all Alaskan residents for economic and non-economic harms to their environment, but no provision was made to allocate portions of this settlement to those who could show specific personal harms. The punitive damage award was, in theory, for purposes other than compensation; in

⁴⁷ *Id.* at 308–09.

⁴⁸ *Id.* at 309.

⁴⁹ *Exxon Shipping Co.*, 128 S. Ct. at 2626, 2637.

practice, it may allow people to receive payments for otherwise uncompensable harms personally suffered.⁵⁰

If the compensation paid by Exxon does not equal the losses it caused even after clean-up efforts then, in theory, the deterrent goals of the tort law will not be met. Here, however, reality should trump theory. Surely, Exxon Valdez provides an object lesson in how expensive carelessness in vetting crew members and running tankers can be. Whether or not Exxon's payout equaled the cost of harm done, it is hard to believe that it has not made Exxon more careful about whom it employs, the protocols it follows, and its willingness to phase out single-bottom tankers. Indeed, this probably would have happened without any tort recovery at all, for the bulk of Exxon's spill-related costs have come from the money it dedicated to clean-up efforts.

Finally, from a moral point of view, the situation is not clear. Although it is hard to have sympathy for Exxon, particularly given its "take no prisoners" attitude toward the litigation, its moral failing, which was to too readily assume a tanker captain had conquered a drinking problem, does not seem like a multi-billion dollar error. Moreover, its liability, apart from punitive damages, might have been the same even if it had no reason to know its captain was a drunkard, for it is largely derivative of the captain's negligence. As for the latter, his negligence

⁵⁰ Under the current settlement plan, approximately \$383 million will be released and distributed to the 33,000 commercial fishermen and other plaintiffs. Still to be determined is the fate of an additional \$70 million, as well as \$488 million in alleged interest owed, which is still the subject of litigation. *See Wesley Loy & Tom Kizzia, Exxon Valdez Settlement Checks Could Be Distributed in October*, ANCHORAGE DAILY NEWS, Aug. 27, 2008, at A1.

was in leaving an inexperienced third mate in command at the wheel when navigating through known perilous waters. It is not obvious that the captain would have done things differently had he not been drinking, though perhaps he would have realized that the paperwork he left the bridge to complete was not a high priority.

Perhaps the Exxon Valdez case should not be a guide, but to the extent it is, it appears that ordinary tort procedures are a poor way to compensate for damages caused by low probability/high consequence events, even when negligence is not an issue.

C. *The 9/11 Attacks*

The aftermath of the 9/11 airplane hijackings provides yet another example of how our system has responded to the harms caused by low probability/high consequence events. In this case, the main response to the damage claims of those killed or injured in the plane crashes or the resulting chaos was the establishment of a compensation fund of up to ten billion dollars and the appointment of a special master to handle distributions from the fund. Although tort suits were not barred and some were eventually brought,⁵¹ they played a small role in recovery by

⁵¹ The tort cases against the aviation defendants (airlines, security contractors, etc.) that arose out of the 9/11 hijackings were consolidated in the courtroom of Judge Alvin Hellerstein a Federal District Judge for the Southern District of New York. According to the *New York Times*, ninety-five lawsuits on behalf of ninety-six victims were filed, and by the time the case was set for trial only forty-one cases involving forty-two victims, ten of whom were injured rather than killed, remained. See Anemona Hartocollis, *Little-Noticed 9/11 Lawsuits Will Go to Trial*, N.Y. TIMES, Sept. 4, 2007, at A1. District court records indicate a substantial further winnowing of these cases. By September 24, the date that was originally set for the trial to begin, only thirteen

individual plaintiffs.⁵² Indeed, if most individuals had not elected to claim through the compensation fund, claimants would most likely have been severely undercompensated. The same legislation that provided for the Victims Compensation Fund (VCF) also capped the liability of the airlines at their insurance coverage limits, which totaled about six billion dollars.⁵³

plaintiffs remained and by November at least three more plaintiffs had settled. Judge Hellerstein pushed hard to secure these settlements, including taking the unusual step of planning to try the damage issues before the liability issues. This was done according to the *New York Times* to secure figures that would provide “a road map toward settlement.” *Id.* As of March 27, 2008, the Southern District website summarizing actions taken in 9/11 related litigation did not indicate that any of the tort cases brought by individual plaintiffs had reached trial, and Hadfield notes that as of February 2008 the list of still active cases was down to six. Gillian K. Hadfield, *Framing the Choice Between Cash and the Courthouse: Experiences with the 9/11 Victim Compensation Fund*, 42 LAW & SOC’Y REV. 645, 675 (2008).

⁵² Businesses, which were not included in the plan that compensated most individuals, did bring tort claims, and there was also litigation over the interpretation of insurance contracts.

⁵³ Stephen Landsman, *Chance to Be Heard: Thoughts about Schedules, Caps, and Collateral Source Deductions in the September 11th Victim Compensation Fund*, 53 DEPAUL L. REV. 393, 396 (2003). Landsman does not provide the insurance cap figure. This estimate comes from statements of the VCF Special Master. See Erin G. Holt, *The September 11 Victim Compensation Fund: Legislative Justice Sui Generis*, 59 N.Y.U. ANN. SURV. AM. L. 513, 514 (2004). The airlines’ liability limits do not cap the total amount tort claimants could as a group have recovered. For example, they could also have sued other defendants for their losses.

Several factors seem to have come together to create the VCF. First, there is the nature of the event. It was seen not just as a tragedy for the people killed or injured but also as an attack on the nation as a whole. A national response which treated the victims as though they had died or been injured while acting for the nation seemed appropriate to many people. Perhaps even more important to Congress was the threat that large scale litigation posed to the nation's already troubled airline industry and the air industry's lobbying for financial aid and protection from liability. Thus, the legislation that established the compensation fund provided, in other sections, up to fifteen billion dollars in cash and loan guarantees for costs the airlines incurred as a result of 9/11.⁵⁴ Third, the costs of compensating individual victims, while large, were manageable. Although ten billion dollars is not a drop in the bucket, it doesn't bust the budget either and, as it

However, federal government agencies, whose failings were regarded by many victims as in part responsible for the losses they suffered, most likely would have been protected by sovereign immunity, and suits against other defendants would have been hampered, as they were for those who chose to sue, by the Bush administration's claims of executive and state secret privilege to prevent the disclosure of information that some plaintiffs thought important to their lawsuits.

Walter Gilberti, *Bush Administration Moves to Stifle Discovery in 9/11 Lawsuits*, Aug. 2, 2002, www.wsws.org/articles/2002/aug2002/bush-a02.shtml.

⁵⁴ Air Transportation Safety and System Stabilization Act of 2001 (ATSA), WORLD SOCIALIST WEBSITE, Pub. L. 107-42, Title IV, 115 Stat. 230 (codified at 49 U.S.C. § 401 (2000)). For a good overview of what the act contains, see Joan Bernott Maginnis, *The 9/11 Victim Compensation Fund: Overview and Comment*, THE FEDERALIST SOC'Y FOR L. & PUB. POL'Y STUD. (2005).

turned out, while compensable damages were assessed at this aggregate statutory limit, collateral recovery rules meant the government did not pay thirty percent of the losses found to have occurred. In addition it has been suggested that Congress simply did not want the 9/11 cases to be handled through the tort system, although it did not completely foreclose this possibility.⁵⁵

Applying to the fund required a person to give up the right to sue any entity for negligence in connection with the 9/11 events. It also meant putting the amount of one's recovery in the hands of the Special Master, Kenneth Feinberg, who did not apply the usual tort rules for calculating losses.⁵⁶ In addition, collateral compensation from all sources except charities was deducted from the amounts awarded victims. These accounted for about thirty percent of the calculated losses, which equaled the ten billion dollar recovery limit the Congress had set.

By most measures, the use of the special fund to compensate individuals harmed by the 9/11 hijackings and subsequent crashes worked well. Ultimately, ninety-seven percent of those people with potential tort claims for the death of a person killed in the attack (2880 claims) opted

⁵⁵ See Hadfield, *supra* note 51, at 650.

⁵⁶ For those killed non-economic damages were with rare exceptions set at \$250,000 plus \$100,000 for a spouse and each dependent. *Id.* Awards for those deceased ranged from a minimum of \$250,000 to a maximum of \$7.1 million with a mean of \$2 million and a median of \$1.7 million. The spread in awards reflects in large measure the earnings of the person deceased, but the compensation awarded the heirs of the highest earners is a smaller proportion of their decedents' earnings than the amounts awarded those with lower incomes. *Id.* at 677 tbl.A5.

to apply to the fund instead of sue, as did 2680 people who suffered injuries but survived.⁵⁷ Awards, which averaged two million dollars (median \$1.7 million) for those killed and \$390,000 (median \$110,000) for those injured, were most often substantial, and for many people compare favorably with what might have been recovered in tort litigation. The costs of administering the fund were low (eighty-seven million dollars) relative to the sum disbursed.⁵⁸ It is not known what sums were paid to lawyers by those who sought legal help in applying to the fund, but at least some representation was pro bono and, in the rest, costs and fees were surely far less than the costs plus contingent fee that would have been taken from a plaintiff's recovery in ordinary tort litigation. Moreover, the injured and representatives of the deceased who applied to the fund were sure to secure recoveries. Recovery would not have been guaranteed in tort litigation.⁵⁹

⁵⁷ Hadfield, *supra* note 51, at 650–51 (citing KENNETH R. FEINBERG, U.S. DEP'T OF JUSTICE, FINAL REPORT OF THE SPECIAL MASTER FOR THE SEPTEMBER 11TH VICTIM COMPENSATION FUND OF 2001, at 1 (2005)).

⁵⁸ A contingent fee at the level contemplated in the Exxon Valdez litigation would, by itself, have been about twenty-five times as much. The Office of the Special Master did not charge for its services; the estimated value of these services was \$7.2 million. Hadfield, *supra* note 51, at 650–51.

⁵⁹ Judge Hellerstein, who heard the tort cases denied the defendants summary judgment, ruling that attempts to hijack airplanes were foreseeable and that the various defendants, including the airlines and airplane manufacturers, had duties toward the plaintiffs or their decedents that may have been breached. Opinion and Order Denying Defendant's Motions to Dismiss, *In re* September 11 Litigation, No. 21 MC 97 (AKH) (S.D.N.Y. 2003), *available at*

Most importantly, the cases were disposed of quickly in comparison to tort litigation. Within three years of 9/11 all compensation determinations had been made and (presumably) paid out. It has taken six years for many of the tort cases that grew out of 9/11 to settle, and half a dozen had yet to be settled as of early 2008.⁶⁰

Thus, if compensation were the only goal of tort law, one might conclude that the VCF had worked well. It is, however, impossible to say whether claimants received more or less than they would have received through tort litigation, though my guess is that after costs are taken into account they would have done worse on average and, most likely, much worse in litigation. Moreover, the VCF had other important advantages as a compensation device. In particular, a survey by Professor Hadfield indicates that the most important motivating factors for those applying to the fund were the speed of the likely recovery, the opportunity to achieve closure and, above all, the opportunity to avoid the emotional distress of litigating.⁶¹

<http://nysd.uscourts.gov/Sept11Litigation.html>. He did not, however, find that there had been breaches of duty, just that the possibility existed. *Id.* This threshold finding was all that was necessary to deny motions by various defendants for summary judgment. *Id.* Almost all the lawsuits settled, but the amounts of settlement and the costs involved are not known.

⁶⁰ Hadfield, *supra* note 51, at 657 (reporting that six cases remained unsettled as of February 2008).

⁶¹ *Id.* at 665 tbl.3. Unfortunately Professor Hadfield's sample of 9/11 claimants is small and could not be drawn at random, so one cannot be certain how well her results generalize to the population of claimants. There is no reason to think her findings about the primary virtues sample claimants saw in the VCF do not typify the claimant population. Some of the complaints

The VCF, like most no-fault schemes, does, however, seem unlikely to promote the tort goal of deterrence, but one should not make too much of this. Airlines and their insurers have so much to lose by terrorist hijackings that the marginal effect of tort suits on their future care taking is likely to be small, if it exists at all. Moreover, as we have seen since 9/11, the airlines have had no choice with respect to numbers of enhanced security measures because they have been imposed by regulation. Other entities, like airline manufacturers and owners and contractors of the World Trade Center, also escaped liability as a result of most victims turning to the compensation fund. But their situation is not like that created by Price-Anderson, where potential tortfeasors know their liability will be limited no matter what their future negligence. Those who might have been, and in some cases were, sued in tort must be aware that they were fortuitous beneficiaries of the nature of event and of what was seen by Congress as a need to bail out the airline industry. Although they were spared liability this time, they and their insurers can see what their potential liability might have been, and they have strong incentives to take precautions commensurate with the liability they might face from similar but not identical incidents.

The VCF scheme fails most in the moral dimension of the tort recovery process and in the incentives litigating parties have to get to the root causes of tragic events as they seek to prove or refute allegations of faulty behavior. Professor Landsman, drawing on a broad range of social-psychological research, suggests that limiting the time available for hearings and making that sample claimants had about the VCF system may, however, be overrepresented among sample respondents since those 9/11 claimants who were most active in seeking information and recovery are likely to be overrepresented in her sample.

irrelevant many of the responsibility issues that the victims of 9/11 or their survivors might wish to probe meant that the VCF was unlikely to fully satisfy victims' needs for emotional satisfaction or be regarded by them as a completely legitimate way to resolve their claims.⁶² Professor Hadfield provides empirical support for Professor Landsman's suggestion with data from a survey she conducted with 9/11 victims.⁶³ Although her numbers cannot be taken as precisely accurate because of the non-random nature of her sample and possible biases in it, there is no reason to think her respondents' attitudes differ substantially from the attitudes of many of those who received compensation through the VCF. She found that while victims place the largest portion of the blame for 9/11 on the terrorists, they also blame other actors for what happened, including the INS, the intelligence agencies, the airlines, the airline security firms, and Presidents Bush and Clinton.⁶⁴ Moreover, well over half of Hadfield's respondents felt that the need to forego other civil action in order to be compensated from the VCF was unfair.⁶⁵ About three-quarters of her respondents felt that in the future Congress should not limit liability for terrorist attacks to the terrorists,⁶⁶ although, except for airports and their security companies, this number fell off when respondents were asked whether the liability of specific potential defendants should be limited.⁶⁷ Interestingly, the proportion of respondents rejecting liability

⁶² Landsman, *supra* note 53, at 409–10.

⁶³ *See generally* Hadfield, *supra* note 51.

⁶⁴ *Id.* at 656 tbl.1.

⁶⁵ *Id.* at 668 tbl.4.

⁶⁶ *Id.* at 669 tbl.6.

⁶⁷ *Id.* at 669 tbl.5.

limitations was perfectly correlated with the average blame attributed to different agents, providing strong support for Landsman's theory about legitimacy. Finally, many respondents were, at least hypothetically, willing to back up their attitudes with money. Only 27.7% of Hadfield's respondents said they would be unwilling to spend part of their recovery to secure a declaratory judgment about the responsibilities of the various agents for the harm they or their loved ones suffered, and 39.5% said they would be willing to spend some of their recovery to secure such a determination.⁶⁸ The remaining respondent's were unsure what they would do if a declaratory judgment were possible on the condition that they pay for it.⁶⁹

Tort suits, because plaintiffs must show fault, provide a mechanism for private parties — through discovery, the assembly of witnesses, and the work of experts—to get at the root causes of tragic events.⁷⁰ Channeling victims out of the tort system into a system that does not require proof of fault negates this possibility, and in the context of 9/11 might be seen as limiting our understanding of 9/11 to the results of official investigations. However, in the context of 9/11, the potential of tort litigation to illuminate what happened was, as can be seen from the tort cases that were filed, limited. Some potential defendants, including perhaps those agencies most likely to have been at fault, like the federal intelligence agencies, the FAA and the military, are protected from suit by sovereign immunity. In addition, the Bush administration interjected claims of privilege to preclude parties from discovering what it regarded as sensitive

⁶⁸ Hadfield, *supra* note 51, at 670 tbl.7.

⁶⁹ *Id.*

⁷⁰ See Robert S. Peck, *The Victim Compensation Fund: Born from a Unique Confluence of Events Not Likely to Be Duplicated*, 53 DEPAUL L. REV. 209, 213 (2003).

governmental information. Moreover, much of the information secured by the tort plaintiffs during discovery was produced pursuant to protective orders, and final settlements apparently provided that the settling parties would release no information about the case. Perhaps for these reasons, no major revelations about the relative responsibility of various parties have emerged from the suits that were brought and settled. Accordingly, I expect that information loss due to channeling cases away from the tort system was in the case of 9/11 more hypothetical than real.

D. Hurricane Katrina and the Flooding of New Orleans

Regardless of how one balances the virtues of the VCF scheme with its deficiencies, the combination of concerns and the sense of solidarity with victims that led to the VCF's creation is unlikely to be duplicated when other low probability/high consequence events strike.⁷¹ We see evidence for this view in the contrast with responses to Hurricane Katrina, an event with fewer deaths but much higher total losses and a far larger group of victims. The legal situation after Katrina is far more muddled than it was after any of the other cases we have examined, no doubt due to the event's scale. Litigation has included disputes over insurance contracts as well as federal and state tort cases encompassing both individual and class actions. Financial and in-kind compensation for harm, as well as funding for rebuilding, has come from the federal government, state governments, and insurance companies. New law suits have arisen from efforts to help remedy the situation, such as cases filed against FEMA for providing temporary trailer homes with unhealthy levels of formaldehyde vapor.⁷² Moreover, we are still too close in time to the disaster to assess all damages suffered or for most legal claims to have been resolved. Where aid and compensation have been provided its adequacy is often unclear.

⁷¹ Landsman, *supra* note 53, at 412.

⁷² See Ralph Blumenthal, *Stalled Health Tests Leave Storm Trailers in Limbo*, N.Y. TIMES, Oct. 18, 2007, at A20; see also *Storm Victims Sue Over Trailers*, N.Y. TIMES, Aug. 9, 2007, at A16 (reporting over 500 people filed suit against FEMA trailer manufacturers).

We can, however, say some things based on what we already know. First, a lot of the money going to those who were displaced, injured, rendered jobless, or otherwise harmed by Katrina has taken forms associated with welfare payments rather than accident compensation. Moreover, as with most welfare payments, needs have often not been met entirely and bureaucratic barriers to prompt aid have frustrated both claimants and those who sought to help.⁷³ Second, much of the money recovered to date has been recovered through insurance claims for property damage and personal injuries. Indeed, much of the litigation that has to date led to compensation has involved disputed interpretations of insurance contracts—not suits in tort.⁷⁴ Third, tort actions of all kinds have been brought against all types of defendants. These range from large scale class actions against the Army Corps of Engineers and FEMA to more localized class action suits against oil companies, cities, and parishes, to single plaintiff actions against individual defendants and small businesses.⁷⁵ Fourth, because of the differential

⁷³ Pamela Winston et al., *Federalism After Hurricane Katrina: How Can Social Programs Respond to a Major Disaster?*, 81 TUL. L. REV. 1219 (2007) (arguing that complex government programs inhibit disaster relief).

⁷⁴ One story in the *New York Times* estimated the insurance payout as of September 2008 at forty-one billion dollars. See Brian Stelter, *Storm's Toll on Insurers Not on Scale of Katrina*, N.Y. TIMES, Sept. 2, 2008, at C8.

⁷⁵ For a good review of the range of larger scale litigation see generally John P. Manard et al., *Katrina's Tort Litigation: An Imperfect Storm*, 20 NAT. RESOURCES & ENV'T 31 (2006). For examples of smaller scale law suits that look much like ordinary tort actions, see Complaint, *Piazza's Seafood World, L.L.C. v. The City of New Orleans*, 2006 WL 3869532 (La. Dist. Ct.

applicability of such defenses as “act of God,” sovereign immunity, and the discretionary exception to the Federal Tort Claims Act, there can be considerable inconsistency in who is able to recover in tort and whom they will be able to recover from, even in situations where injuries suffered and causes of injury are almost identical. Thus, the federal judge hearing the litigation growing out of the New Orleans flooding dismissed one class action involving 350,000 claimants because he found that the levees that were breached due to faulty construction were part of flood control efforts, meaning recovery was barred by the Flood Control Act of 1928 which states that “[n]o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place.”⁷⁶ But a few weeks later the same judge held that a class action based on a similar breach in flood walls around a canal allegedly due to negligent

2005) (No. 626-371) (Suit to recover the cost of perishable product that was spoiled when storage facilities owned by the City of New Orleans lost power during Katrina. The private entity that operated the facility on behalf of the city was also named as a defendant.) Complaint, at 5, Mineo ex rel Mineo v. Underwritings Lloyds London, 2008 WL 4724010 (La. Dist. Ct. 2005) (No. 626-291) (Suit filed by the heirs of a man who died at an assisted living facility after Hurricane Katrina left the facility without power. This plaintiffs claim that the center should have evacuated their father and otherwise provided him a safe environment.) *See also* Complaint, Ehlinger v. Metairie Towers Condo. Ass’n, Inc., (La. Dist. Ct. 2005)(No. 626-251) (Plaintiffs claimed that they were denied access to their condominiums for several weeks following Hurricane Katrina. Plaintiffs filed suit against the owner and manager seeking injunctive relief.).

⁷⁶ 33 U.S.C. § 702(c) (2000).

maintenance by the United States Corps of Engineers could proceed because the canal project was related to navigation and not flood control.⁷⁷ Fifth, many of the injuries suffered due to the negligence of the government and others will not be compensable through tort actions. In some cases, like the injuries due to the levee breach mentioned above or the damages inevitably incurred by some during the course of clean-up efforts, federal law does not permit recovery against the sovereign.⁷⁸ In other cases, the defendants will simply not have sufficient funds to pay for the damages they allegedly caused. And in some cases brought against local governments, class action plaintiffs may in some measure be suing themselves because any recovery would come out of funds created by their taxes. There will, of course, also be situations where negligence cannot be shown. For example, in a case brought against Jefferson Parish, the plaintiffs claimed the parish erred by allowing those employees who manned pump stations to leave their posts during Katrina, arguably resulting in the flooding that subsequently occurred. However, the pumping stations did not have facilities designed to withstand Category 4 and 5 hurricanes,⁷⁹ and it is hard to imagine that a jury will find parish officials negligent for following a pre-existing plan designed to protect the lives of those manning the pumping station.

⁷⁷ See Adam Nossiter, *In Court Ruling on Floods, More Pain for New Orleans*, N.Y. TIMES, Feb. 1, 2008, at A16. This decision was reversed on appeal. *Id.*

⁷⁸ See generally Samantha Turino, *Cleaning Up Disaster or Making More? A Look at Avenues of Relief for Those Devastated by the Clean-up Efforts of Hurricane Katrina*, 18 VILL. ENVTL. L.J. 83 (2007) (discussing damages inflicted due to negligence in the planning and subsequent carrying out of clean-up activities).

⁷⁹ Manard et al., *supra* note 75, at 34.

If these problems were not enough, the transaction costs in securing recovery through the tort system are likely to be huge. Numerous difficult issues of fact and law must be resolved, and, unlike the other events we have focused on, there is no easy way to bind causes of action together in a single class action, nor can one imagine providing a single compensation scheme to which all those injured can apply. Because the causes of damage in different areas struck by Katrina were different and because differently caused injuries raise different issues of fact and law, we see different configurations of plaintiffs aligned against different defendants in many different individual and class actions. As for the possibility of a no-fault compensation scheme, even if substantial incentives for such a scheme existed, the total damages seem too high to make this politically feasible. For example, two scholars estimate the Katrina-caused damage at \$141 billion, not counting economic harm attributable to personal injuries, loss of life, loss of wages and general environmental damage.⁸⁰ While much of this damage is to publicly funded infrastructure, the private losses to business and individuals remain huge.

So, from a compensation standpoint, neither the tort system nor welfare-oriented relief, nor a combination of the two seems adequate for a satisfactory outcome. Considerable harm is likely to remain uncompensated even when the harm was in large part negligently caused. Moreover, even when tort cases are resolved in amounts commensurate with the harm suffered, transaction costs will ordinarily have been high, recovery will only occur after substantial delay and some tortfeasors, perhaps themselves impoverished by the flood, will be unable to pay

⁸⁰ MARK L. BURTON & MICHAEL J. HICKS, HURRICANE KATRINA: PRELIMINARY ESTIMATES OF COMMERCIAL AND PUBLIC SECTOR DAMAGES 1 (Sept. 2005), *available at* <http://www.marshall.edu/cber/research/katrina/Katrina-Estimates.pdf>.

judgments against them. Other harm, such as much of the damage that Katrina did in Mississippi, may have occurred through no one's fault. Large numbers of tort actions are ongoing, and there is no telling when most will be settled or resolved. Considerable compensation has been provided relatively quickly to a subset of insured claimants, but even those who had insurance are often being compensated for less than their entire loss, and there has been extensive litigation over definitions of included and excluded causes of harm.

From a standpoint of the moral considerations that underlie tort law, the situation is even less satisfactory, if that is possible. On the one hand, the storm was so severe and its consequences so unexpected, whether or not they should have been, that nature, more than man, seems responsible for the harms done. This certainly seems true of situations like the Jefferson Parish case where pump-house workers were told to seek shelter elsewhere because of the danger to their lives. It is likely to be true in many other situations as well where people may have been less than completely careful, but they were trying to cope as best they could with unprecedented stresses and challenges. On the other hand, without clear and severe failures of duty, the worst of the damage in New Orleans would almost certainly have been avoided. However, the organization whose failures did the most harm, the Army Corps of Engineers, may, because of sovereign immunity, the Flood Control Act of 1928, and exceptions to the Federal Tort Claims Act, end up having no adjudicated responsibility at all. Moreover, if the Corps is held responsible, it will not be the Corps that pays but the country as a whole, thus weakening the connection between the organization at fault and those who pay the costs of the faulty behavior.

There also seems to be little to gain in the way of deterrence by proceedings in tort. To the extent the government is held responsible and must pay for damages attributable to the negligence of its agents, no one whose decisions and actions caused the harm will be paying out

of his or her own pocket. Neither the Corps nor the government, whose leaders turn over rapidly, is likely to draw from an obligation to pay damages a lasting lesson that they would not otherwise have learned. Rather, incentives for greater future care will arise out of professional pride and the realization of the harm that less than careful work and inadequate margins of safety can cause. There is also likely to be less reluctance in agencies to take seriously the possibility of worst cases, though how long this lasts remains to be seen. The one group whose behavior has been affected by the Katrina payouts is insurance companies. They are taking more care in what property they insure, the rates they charge, and the clarity with which they define exclusions. This is perhaps for the best, but it is hardly a triumph for the post-Katrina legal process.

IV. AN ASSESSMENT

Where does this review of the different ways in which our legal system has responded to the harms caused by low probability/high consequence events leave us? In a word: discouraged. No response has been entirely adequate. The one which seems to have worked best, the 9/11 Victim's Compensation Fund, benefited from a set of special conditions, including a relatively small group of easily identifiable victims that may never arise again. Arguably, the compensation scheme for the Three Mile Island leak worked just as well, but the scale of harm there meant that the Price-Anderson mechanism was never really tested. Significantly, both the VCF and Price-Anderson seem to have arisen not from a desire to compensate accident victims but from the lobbying of, and a desire to protect, an industry. No-fault victim compensation

appears to be the price paid to get this protection.⁸¹ Moreover, both the VCF and Price-Anderson place caps on the total amount victims can collect, regardless of the harm done. While the 9/11 caps allowed for what seem to have been generous awards, the constraint of the cap held at least some awards, particularly those for very high earners, below what tort standards called for, and considerable consequential damages, such as lost business, lost wages, and property damage, were not covered by the VCF.⁸² The cap incorporated into Price-Anderson is, coincidentally, about the same today as the VCF cap, but the damages that might emerge from a serious nuclear plant meltdown could be an order of magnitude larger than the damages that occurred on 9/11.⁸³

The two situations in which the tort system remained the primary mechanism for compensating injured individuals present an even less pretty picture. The Exxon Valdez oil spill

⁸¹ The original bill to aid the airline industry after 9/11 did not include provisions for compensating those injured. According to news reports, this was the price that the Democrats in Congress insisted on to get their support for airline protection. It does not appear, however, that there was much resistance when proposals to include a victim compensation fund in the bill were made. See Diana B. Henriques & David Barstow, *Fund For Victim's Families Already Proves Sore Point*, N.Y. TIMES, Oct. 1, 2001 at A1, cited in Janet Cooper Alexander, *Procedural Design and Terror Victim Compensation*, 53 DEPAUL L. REV. 627, 694 (2003).

⁸² The exception is the airline industry which received considerable assistance to enable the industry to weather the storm of 9/11 and get back on its feet.

⁸³ Congress could add funds to compensate victims of a nuclear-related accident beyond the Price-Anderson limit, but even though this possibility is provided for in the Act, there is no guarantee it would happen, much less happen in adequate amounts.

litigation lasted a decade and a half, vast sums were spent in the litigation effort by both parties, and the plaintiffs who recovered punitive damages in the tort suits growing out of the accident had to wait more than thirteen years after their initial award before being granted a small fraction of what the jury originally awarded. Allowing tort recovery may have worked in one respect in that the threat of a trial perhaps induced Exxon to settle claims from the state of Alaska for about one billion dollars, but this money is not being channeled to victims to compensate for harms personally suffered. The bulk of the money Exxon dispensed as a result of its oil spill, more than three billion dollars, went not to victim compensation but to environmental clean-up. Even this sum has not reversed the spill's environmental impact, and it is possible no sum could. Moreover, Exxon's willingness to spend money on clean-up activities appears due more to regulatory law and political forces than to the threat of tort litigation.

The situation following Hurricane Katrina, especially in New Orleans, seems even worse. There the tangled mass of litigation threatens to rival the mess the flood waters left behind. Courts are swamped with suits in both torts and contract. In many cases, blame is hard to assess, and the most clearly blameworthy actors may be immune from liability. No one knows when or how this mass of litigation will be resolved. When we finally are at a stage where we can look back on these lawsuits, we are certain to see considerable uncompensated harm along with tremendous transaction costs.

V. CAN REFORMS HELP?

Given this situation, we can ask whether there are any reforms that we might make in anticipation of another low probability/high consequence event that might help. Perhaps there are, but none will be easy to make, including those that require only minor changes to the existing system. A place to start thinking about improvements is by noting that, if the four

events I focus on in this article are what we mean by low probability/high consequence events, not all such events are in fact of low probability. For a number of years before Katrina, scientists were confident that it was only a matter of time, and perhaps not that much time, before New Orleans experienced a storm of such fury that much of the town would be flooded.⁸⁴ What they did not expect was that the flooding would be due to the failure of storm walls and levees rather than to their overtopping by the quantity of rain. Similarly, ships occasionally run aground, even when their captains are not drunk. Tanker oil spills, including some that did considerable ecological damage, had occurred from time to time before the Exxon Valdez struck its reef. What made the Exxon Valdez spill special was the amount of oil that escaped, the pristine place where the spill occurred, and the scale of the fishery that was disrupted. Even nuclear accidents can be seen as inevitable, for machinery degrades and human error can never be entirely eliminated.⁸⁵ In short, of the incidents examined in this article, only 9/11 can be regarded as completely surprising. No prior model of nature or of human nature would have predicted that terrorists would hijack four airplanes and crash two of them into skyscrapers and one into the Pentagon.

Recognizing this, one might say that from the standpoint of risk anticipation an event like Katrina or the Exxon Valdez oil spill does not differ greatly from an ordinary accident, such as a pedestrian being struck by a drunk driver. Like Katrina, such incidents are inevitable, and, like Katrina, there is a very low probability of such an incident happening at a specific time and

⁸⁴ See John Travis, *Scientists' Fears Come True as Hurricane Floods New Orleans*, 309 SCI. 1656 (2005).

⁸⁵ See generally PERROW, *supra* note 1.

place in a specific way to a specific person. Seen in this light, most serious accidents are low probability/high (local) consequence events. Two differences, however, make all the difference. The number of accidents caused by driving and the average harm they produce are actuarially predictable, and specific accidents pose what are usually easily manageable fact-finding challenges. These features make possible the efficient development of third-party insurance schemes and legal and organizational routines that allow the tort system to function tolerably well. But even if a category-five hurricane or a nuclear leak is, over time, inevitable, events of these sorts are so rare and the scope of the damage they cause so broad that ordinary insurance schemes and legal routines for resolving disputes do not fit the problems they pose. Dealing with problems of this sort requires governmental planning and actions.

One cannot, for example, expect the deterrence associated with the threat of tort litigation to lead to adequate precautions against harms that may be caused by rare, high consequence events even if given enough time, certain rare harms are almost inevitable. Short, personal time horizons (“There may be an accident, but most likely not in my lifetime.”), psychological denial (“I wouldn’t live here if I thought I might be killed in an earthquake.”), and moral hazard (“If there is a catastrophe, the damage will be so great that the government will bail me out.”) make it almost inevitable that insufficient precaution will be taken. Thus, to prevent or minimize the harms associated with potentially catastrophic rare events, the government, instead of relying on actor self interest and deterrence, must turn to planning and regulation. Examples include laws that forbid building or rebuilding in vulnerable flood plains, requirements that buildings can withstand earthquakes of a certain magnitude, and mandates that oil be transported in double hulled tankers.

Advance planning should also include compensation when severe risks are realized. Insurance schemes can be developed to allow first-party compensation for much of the damage caused by events like floods and earthquakes that are severe and unpredictable, but, over time, inevitable in some regions. Insurance may be mandatory in certain situations or, as with flood insurance, costs may be subsidized by the government both as an incentive to buy the insurance and as a way to make it affordable.⁸⁶ But such subsidies have a cost, for they encourage risky behavior, like building and rebuilding in flood plains. Alternatively, governments can establish insurance-like compensation systems that are not premium based. Taxation may be used to establish funds that can pay for damages that although locally and temporally uncertain are, over the long run, almost certain to occur, and these systems may relate to the risk those taxed incur. For example, single- and double-bottomed tankers that travel in U.S. waters might be taxed at different rates, both to encourage a shift to double-bottomed tankers and to accumulate funds to help clean up and compensate for major oil spills. Taxes might be levied on those who choose to build in known flood plains or on earthquake prone land, both to discourage such choices and to establish funds that can compensate for the harms that will arise when the known risk is realized.⁸⁷

⁸⁶ Flood insurance in certain areas may, for all practical purposes, be mandated even though the government does not require it since adequate insurance may be required to secure a mortgage.

⁸⁷ There may be creative ways to impose such taxes both to diminish resistance to them and to make them easier to bear. For example, an earthquake or flood fund tax might be levied only when property changes hands and then on only a portion of any capital gain. If this were done, a building owner would almost always have the funds needed to pay the tax. The existence of the

If insurance or other funds were created for the benefit of those willing to take serious but rarely realized risks, and if the risks were in fact realized, compensation from the funds should be on a no-fault basis. So long as the fund is sufficient to pay reasonable sums for the damages suffered, tort actions, perhaps with an exception for gross negligence that exacerbates injuries, should ordinarily be barred by those seeking fund payouts.⁸⁸ This does not guarantee freedom from litigation, but it is notable that post-Katrina, insurance companies have paid out over forty-one billion dollars for damages suffered, while the tort system is lumbering along with few recoveries in sight.⁸⁹ Both the litigation and non-litigation costs of determining payment eligibility can be further reduced if no coverage exclusions are allowed for event-caused harms, except perhaps for damage exacerbation due clearly reckless behavior.⁹⁰ For example, many of

tax would also lower the value of property subject to the tax, thus making it easier for prospective purchasers to factor the risks they are taking into their purchase decisions.

⁸⁸ Whether there should be an option to pursue recovery through tort action in lieu of turning to the fund, may depend on the risk covered and involves a level of detail beyond the scope of this article.

⁸⁹ See Stelter, *supra* note 74.

⁹⁰ I don't believe that simple negligence should justify recovery exclusions because in the course of an emergency many people might act in ways that in retrospect look careless. Litigating what was and was not careful behavior given the circumstances is likely to be costly, and the threat of such litigation could be a negotiating tactic on the part of insurers and fund managers.

Moreover, to the extent that deterrence requires the rational consideration of options, even if

those harmed by Katrina, particularly near the Mississippi coast, had homeowners policies that covered wind and wind-driven water damage but not damage from flooding. Not surprisingly, disputes between home owners and adjusters and subsequent court cases arose over whether water damage should be attributed to wind-driven water or to flooding. Yet, from both the home owner's and society's point of view, the natural mechanism behind the harm suffered doesn't matter. Regardless of mechanism, Katrina was responsible for the harm, and the homeowner's need for compensation is the same. Moreover, both sources of harm are actuarially predictable and thus amenable to incorporation in insurance rates.

Widespread insurance or insurance-like funds would enhance compensation in predictable disasters and minimize transaction costs. Together with appropriate regulation such schemes might be more than adequate substitutes for the deterrence function of tort law. The tort goal of deterrence is to minimize the cost of accidents. From a social cost point of view, what matters is the degree of cost minimization and not the mechanism of minimization unless that mechanism imposes its own costs. The challenge is to establish insurance and regulatory regimes that work to minimize future accidents as well as or better than the tort system without imposing greater costs than those that attend the threat of tort liability and actions to recover in tort.⁹¹ This challenge should be easy to meet in the case of statistically inevitable but low

knowledge of the costs of negligence were widespread, it would probably be of low salience in the kinds of situations discussed in this article.

⁹¹ For example, defensive medicine is thought to be a cost imposed by the threat of tort compensation while lowered incentives to take care (moral hazard) are thought to be a cost of insurance schemes.

probability events. Under the current system, the long run benefits of acting voluntarily to ameliorate the consequences of unlikely events are likely to be trumped by more salient and immediately felt short term costs even if, in retrospect, the failure to take certain precautions would be regarded as negligent. Moreover, we should be concerned not just with reducing the cost of accidents, which entail some kind of human agency, but with reducing the costs of other tragic incidents. Here, tort law offers no benefits. But regulation, such as mandated earthquake proofing or compulsory insurance, can, by increasing the up-front costs of taking risks, discourage unjustified risk taking behavior.

One problem with insurance systems and compensation funds is that caps are typically placed on recoveries. Open-ended liability often appears intolerable, but in the case of widespread disasters an insurance or other fund might be exhausted before full compensation is paid. If, as with Price-Anderson, the fund must be constituted by those who may create the eventually realized risk, recourse to the class of risk creators for replenishment of the fund seems like a natural and justified step. In the case of Price-Anderson, such contingent liability would work to guarantee adequate compensation for those harmed; it would increase the deterrent value of the regime, and it would enhance the moral justification for the program. But without a cap, those required to provide compensation under the Act would wonder what they would be getting out of a post-accident collective responsibility scheme beyond a guarantee that any losses they create will be shared by the entire industry. Individual companies might well be better off under a tort regime, for then they would, in theory, have to pay nothing unless their negligence could be shown, and the need to prove negligence would in the usual case allow them to bargain for settlements below the cost of the harm they caused. So caps seem not only characteristic of but

also necessary for acceptable insurance and related schemes. The issue is the adequacy and fairness of the cap. It is on these dimensions that Price-Anderson, arguably, falls down.

The current Price-Anderson cap no doubt reflects the lobbying strength of the nuclear power industry far more than a Congressional concern that a higher cap or no cap might force some reactor companies into bankruptcy and potentially destroy the industry. But were Congress acting uninfluenced by lobbyists, at some point the fiscal implications of forcing all companies to pay the total costs of a catastrophe which occurred at one of them would be a legitimate concern. There are, perhaps, other options. For example, Congress could mandate that, if damages exceeded a monetary cap, further payment could take the form of issuing stock to victims up to the point where the market value of the stock would fall below a certain low level. Such “in kind” payment would provide additional funds to victims, would not require the industry to divert further cash from its business activities, and would give a company’s shareholders an incentive to ensure not just that their company was taking exceptional care, but also that the industry as a whole was well regulated and the likelihood of a serious accident at any nuclear plant was minimal.⁹²

⁹² Nothing is costless. One might argue that the existence of such a scheme would hamper the industry by making it more difficult for it to raise funds through stock offerings. But the same features that lead people to downplay such risks as living near a nuclear plant should also work to make them downplay the risks of investing in one. Thus the costs of such a scheme to capital acquisition might be considerably less than a rational actor analysis would indicate. They would also, of course, be less to the extent that potential shareholders felt the nuclear industry as a whole was well-regulated but not over-regulated, which is a virtue of the scheme. Since it is

However, as the cases we have used for examples suggest, moving from a fault-based to a no-fault compensation regime inevitably slights the moral dimension of tort law. There are real costs here in terms of victim satisfaction and system legitimacy, as the work of Landsman and Hadfield indicate.⁹³ I believe that these costs are worth trading off if, in return, we achieve the goals of greater and more certain compensation and lower transaction costs. There is, however, as Katrina's aftermath reveals, at least one circumstance where attention to the moral dimension of compensation schemes does not conflict with goals of increased compensation and lower transaction costs, and, indeed, where ignoring morality subverts these other goals. Here, I am referring to the patchwork of rules and regulations that allow governments to avoid paying the costs of their own carelessness. Katrina would have caused great devastation in New Orleans regardless of the quality of the city's defenses, but the costs were increased many fold by the shortsightedness and negligence of the Army Corps of Engineers in building canals and constructing levees and by actions of other state and federal agencies, both before and after the hurricane struck. Determining which governmental actions escape demands for legal relief under the doctrine of sovereign immunity, the specific provisions of the Flood Control Act of 1928, and the exceptions to tort immunity found in the FTCA has itself been the subject of considerable lengthy litigation. To the extent the government avoids paying the costs of its

reasonable to suppose that investors would know more about the situation of the company they propose to invest in than they do about other companies, the cap on stock contributions to the fund might be different for the company that was responsible for the accident, at least if its negligence could be shown.

⁹³ See generally Landsman, *supra* note 53; see also Hadfield, *supra* note 51.

negligence, it will not only be avoiding a moral obligation to pay for harms it caused, but it will also be concentrating substantial costs on a relatively small group of victims rather than spreading them through the country as a whole.

This does not mean that the exceptions built into the FTCA or provided for by other statutes or common law principles are necessarily bad. The FTCA exceptions, in particular, have the benefit of insulating the government from lawsuits when discretionary decisions taken with care and in good faith result in harm and, only in hindsight, look careless. Perhaps the government should compensate for such harms regardless, but this is not what tort law demands. However, when it is clear that decisions, whether sovereign and discretionary or not, can be proved poorly judged when made, the case for protecting the government from tort liability crumbles. At best, the case against government compensation is reduced to an argument that the law should not constrain the polity to pay out untold billions of dollars regardless of whether those who would be compensated have a moral claim to that money and need compensation to be made whole. This is a hard-hearted justification to say the least.

Thus, if recovery for low probability/high consequence events is to proceed in a tort framework, I suggest that some of the protections the government enjoys when it is sued should be removed. In particular, when governmental carelessness is clearly responsible for substantial harms, the government should not be able to impose defenses that avoid liability by virtue of its special status. In giving up its special status, the government might, however, demand something in return. Because of the danger of hindsight bias or an undue willingness to reach into the government's deep pockets, as well as good reasons why we want to keep the government from being bogged down in litigation, the government might require that its lack of care be shown by a higher standard than the preponderance of the evidence, and it might require

actions against to be brought in the Court of Claims or other specialized tribunals as conditions for waiving its special defenses. A related reform contingent on the waiving of special governmental defenses might be to require a single trial that establishes both governmental liability for an event and a best estimate of the total costs for which the governmental is responsible. Payment of the amount thus established might go not to separate plaintiffs or a plaintiff's committee, but into a fund that would be distributed under the guidance of a special master as the 9/11 disbursements were.

These suggestions are intended for incidents that, although rare, occur through understood mechanisms and, over time, appear more or less inevitable. They apply less well to events like 9/11 which cannot be anticipated except at the broadest level of generality. Although it was possible before 9/11 to say with some confidence that there will be a terrorist attack on the United States,⁹⁴ that is like saying that the weather will cause havoc in some part of the country. It may be true, but this knowledge is not conducive to well-calibrated insurance schemes,⁹⁵ nor

⁹⁴ At least one such attack, a plot to bomb the Los Angeles airport, had been thwarted by a combination of lucky circumstances and an attentive border control agent. There had also been an earlier attack on the World Trade Center which had not brought down the towers. See Laura Mansnerus, *Man is Guilty in Bomb Plot at Millennium*, N.Y. TIMES, July 14, 2001, at B6; David Johnston, *Fugitive in Trade Center Blast is Caught and Returned to U.S.*, N.Y. TIMES, Feb. 9, 1995, at A1; see also Neil MacFarquhar, *In Bombing Trial, a Deluge of Details*, N.Y. TIMES, Mar. 19, 1995, at 40.

⁹⁵ National health insurance would, of course, help pay for the medical costs of those injured regardless of why the injury occurred.

since it is difficult to anticipate the mechanism of harm to consequence amelioration through regulation. It is possible that in such instances the best we can do is to rely on ad hoc political solutions, as we did in 9/11, and to recognize that without political solutions we will have to make due with a civil law regime that is certain to prove inadequate.

VI. CONCLUSION

As I said at the outset, I thought the task set for me was more difficult than that set for other conference participants because I was charged with discussing reforms that would allow the legal system to deal effectively with incidents that were not only very costly but also often difficult, if not impossible, to imagine. To anchor this task in more than just my imagination, I chose to focus on recent incidents that seemed most like the kind I was charged with examining, and to explore how the civil justice system coped with them. Looking at the four cases I have used as examples, I think we can conclude that in the face of rare catastrophic events no minor changes to the current tort system will come close to achieving all the goals that tort law aims at. Developing alternative systems of adjudication and compensation may allow us to do better, but when faced with unexpected events that create unprecedented harms we should not expect to achieve perfection, or anything close to it. It may be that the best we can do is somehow to muddle through. If it is any comfort, muddling through has worked for humans as a race since the dawn of evolution.