IF TERROR REIGNS, WILL TORTS FOLLOW?

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INTRODUCTION

The tragedy of September 11 has changed the way that Americans live. We are subject to greater scrutiny in airports, buildings, hotels, concerts, sports events—wherever we gather in large numbers. Industry has dramatically increased its security standards. Disaster plans, contingency plans, evacuation plans, and emergency response plans—whatever name one wishes to give to the steps that will be taken by a person or entity to protect human health and life, and to maintain business continuity in response to a variety of hypothetical terrorist attacks—have multiplied.

We pray that 9/11 is an event in American history that will never repeat itself. Vigilance remains the challenge; complacency is the fear. If terror reigns, however, will torts follow? This paper aims to make a contribution to the issues facing potential tort plaintiffs and defendants in the context of a post-9/11 world. **Will 9/11 affect the "duty of care" that is the *sine qua non* of a tort action? And in the post-9/11 efforts to develop emergency plans trying to anticipate different forms of terrorist attacks, who may be at risk from the attacks, and how to respond to the attacks, will courts permit the recovery of economic losses?** And if so, will a jury's finding on "foreseeability" be predetermined?

Using the 1928 decision in *Palsgraf v. The Long Island Railroad Company*[1] and the 1985 decision in *People Express Airlines, Inc. v. Consolidated Rail Corporation et al.*,[2] as a backdrop, the importance of "context"—the historical framework within which a duty/foreseeability determination is made—is first emphasized. Next, this article identifies talked-about biological, chemical, radioactive, and conventional terrorist threats in an attempt to describe the duty/foreseeability context of future torts arising out of terrorist attacks. Finally, this article examines legislative actions designed to limit liability for claims arising out of terrorism-related acts, the impact of terrorism-excluded insurance coverage, and pending legislation which attempts to address insurance risks posed by terrorism.

DUTY OF CARE UNDER PALSGRAF

Although decided nearly 75 years ago, the *Palsgraf* decision has had a continuing impact on tort law. The facts are straightforward. Mrs. Palsgraf had the misfortune of being injured by falling scales when she was standing on a rail passenger platform awaiting her train to Rockaway Beach.[3] The injury followed this sequence of events. "A train stopped at the station, bound for another

1. 162 N.E. 99 (N.Y. 1928).
2. 495 A.2d 107 (N.J. 1985).
3. *Palsgraf*, 162 N.E. at 99.

place."[4] A man carrying a package under his arm ran to catch a train.[5] The package was wrapped in a newspaper.[6] The man jumped aboard the car.[7] He appeared unsteady so a guard, who had held a door on the train open for the man, reached forward to help the man.[8] Another guard on the platform pushed the man from behind.[9] The package carried by the man fell upon the rail tracks.[10] The package "contained fireworks, but there was nothing in its appearance to give notice of its contents."[11] The fireworks exploded.[12] "The shock of the explosion threw down some scales at the other end of the platform many feet away."[13] Mrs. Palsgraf was struck by the scales, was injured, and sued.[14] A jury found the defendant liable for Mrs. Palsgraf's damages.[15] The defendant appealed.[16]

A majority of the New York Court of Appeals reversed.[17] Writing for the Court of Appeals, Judge Cardozo determined that the conduct of the guard "was not a wrong in its relation to the plaintiff, standing far away."[18] Because there was nothing about the package that gave notice of its potentially perilous contents, the railroad was found to have owed no duty to Mrs. Palsgraf:

> If no hazard was apparent to the eye of ordinary vigilance, an act innocent and harmless, at least to outward seeming, with reference to her, did not take to itself the quality of a tort because it happened to be a wrong, though apparently not one involving the risk of bodily insecurity, with reference to some one else.[19]

The Court of Appeals explained that any other result would be untenable, giving these pre-9/11 examples:

> A guard stumbles over a package which has been left upon a platform. It seems to be a bundle of newspapers. It turns out to be a can of dynamite. To the eye of ordinary vigilance, the bundle is abandoned waste, which may be kicked or trod on

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4. 162 N.E. at 99.
5. *Id.*
6. *Id.*
7. *Id.*
8. *Id.*
9. 162 N.E. at 99.
10. *Id.*
11. *Id.*
12. *Id.*
13. *Id.*
14. 162 N.E. at 99.
15. *Id.*
16. *Id.*
17. *Id.*
18. *Id.*
19. 162 N.E. at 99.

> with impunity. Is a passenger at the other end of the platform protected by the law against the unsuspected hazard concealed beneath the waste?[20]
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> One who jostles one's neighbor in a crowd does not invade the rights of others standing at the outer fringe when the unintended contact casts a bomb upon the ground. The wrongdoer as to them is the man who carries the bomb, not the one who explodes it without suspicion of the danger. Life will have to be made over, and human nature transformed, before prevision so extravagant can be accepted as the norm of conduct, the customary standard to which behavior must conform.[21]

There was a lone dissent.[22] Judge Andrews argued that the act of knocking the package from the passenger's arm was negligence.[23] The only issue thereafter was what damage proximately flowed from the negligence.[24] Saying that injury in some form was probable based on the explosion that followed, Judge Andrews felt that, as a matter of law, he could not say that Mrs. Palsgraf's "injuries were not the proximate result of the negligence."[25] Judge Andrews borrowed this example from an "unpublished manuscript" on the law of torts:

> A chauffeur negligently collides with another car which is filled with dynamite, although he could not know it. An explosion follows. A, walking on the sidewalk nearby, is killed. B, sitting in a window of a building opposite, is cut by flying glass. C, likewise sitting in a window a block away, is similarly injured. And a further illustration: A nursemaid, ten blocks away, startled by the noise, involuntarily drops a baby from her arms to the walk. We are told that C may not recover while A may. As to B it is a question for the court or jury. We all agree that the baby might not. Because, we are again told, the chauffeur had no reason to believe his conduct involved any risk of injuring either C or the baby. As to them he was not negligent.[26]

Judge Andrews argued, however, that the chauffeur's "belief that the scope of the harm he might [inflict] would be limited is immaterial" because "[h]is act unreasonably jeopardized the safety of any one who might be affected by it."[27] In other words, the duty existed. If recovery is to be denied to C and to the baby, it is because of the absence of proximate cause, Judge Andrews argued, adding: "And here not what the chauffeur had reason to believe would be the result of his conduct, but what the prudent would foresee, may have a bearing. . . ."[28]

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20. 162 N.E. at 100.
21. *Id.*
22. *Id.* at 101 (Andrews, J., dissenting).
23. *Id.* at 105.
24. *Id.*
25. 162 N.E. at 104-05.
26. *Id.* at 104.
27. *Id.*
28. *Id.*

And in comments that have been quoted often to explain decisions finding no duty of care, Judge Andrews declared: "It is all a question of expediency. There are no fixed rules to govern our judgment. There are simply matters of which we may take account. . . . There is in truth little to guide us other than common sense."[29]

FORESEEABILITY UNDER *PEOPLE EXPRESS*

Fast forward nearly 60 years. *Palsgraf* happens to be the first decision (among many) cited by the New Jersey Supreme Court in *People Express Airlines* where the discussion of legal duty and foreseeability of harm produced the opposite outcome.[30]

The facts were again uncomplicated. "On July 22, 1981, a fire began in the Port Newark freight yard of defendant Consolidated Rail Corporation (Conrail) when ethylene oxide . . . escaped from a tank car, punctured during a 'coupling' operation with another rail car, and ignited."[31] The plaintiff was an airline that was housed in the North Terminal building of the adjacent Newark Airport.[32] Fearing the risk of an explosion from the burning tank car, the airline's employees were evacuated and not permitted to return for 12 hours.[33] People Express sought damages for the economic losses it alleged were sustained by its inability to conduct business for this length of time.[34] The trial court granted summary judgment to the railroad.[35] The Appellate Division reversed,[36] and the New Jersey Supreme Court affirmed the Appellate Division's decision.[37]

At oral argument before the New Jersey Supreme Court, People Express argued that "some of the defendants were aware from prior experiences that ethylene oxide is a highly volatile substance. . . "[38] Wisely, in hindsight, it also argued that "emergency response plans in case of an accident had been prepared."[39] And, in fact, after the fire occurred, "some of the defendants' consultants helped determine how much of the surrounding area to evacuate. The municipal authorities then evacuated the area within a one-mile radius

29. 162 N.E. at 104.
30. *People Express Airlines*, 495 A.2d at 107.
31. *Id.* at 108.
32. *Id.*
33. *Id.*
34. *Id.*
35. 495 A.2d at 109.
36. 476 A.2d 1256 (N.J. App. Div. 1984).
37. *People Express Airlines*, 495 A.2d at 107.
38. *Id.* at 108.
39. *Id.*

surrounding the fire to lessen the risk to persons within the areas should the burning tank car explode."[40]

People Express did not claim physical harm to person or property.[41] Its alleged losses were purely economic.[42] By seeking a recovery, it was challenging a "virtually *per se* rule barring recovery for economic loss unless the negligent conduct also caused physical harm,"[43] a doctrine that continues to be the subject of considerable analysis and debate.[44]

The court surveyed the case law and concluded that the rationales supporting the prohibition on recovery of economic loss, while understandable, were so riddled with exceptions that meritorious claims were being unfairly denied: "The asserted inability to fix chrystalline formulae for recovery on the differing facts of future cases simply does not justify the wholesale rejection of recovery in all cases."[45]

The New Jersey Supreme Court reviewed those exceptions, focusing its analysis on (1) the foreseeability of events and (2) what the defendant knew or should have known about the consequences of the defendant's acts.[46] One group of exceptions, the New Jersey Supreme Court explained, involved the "special relationship" between an alleged tortfeasor and a plaintiff deprived of economic expectations even though it did not have a direct relationship with the defendant:

> Courts have justified their finding of liability in these negligence cases based on notions of a special relationship between the negligent tortfeasors and the foreseeable plaintiffs who relied on the quality of defendants' work or services, to their detriment. The special relationship, in reality, is an expression of the courts' satisfaction that a duty of care existed because the plaintiffs were particularly foreseeable and the injury was proximately caused by the defendant's negligence.[47]

The New Jersey Supreme Court cataloged the "special relationship" cases in the category of "negligent misrepresentation" and cited numerous examples, involving auditors, surveyors, termite inspectors, engineers, attorneys, notaries, architects, and weighers who were found to have had a duty to plaintiffs making claims against them.[48]

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40. 495 A.2d at 108.

41. *Id.* at 109.

42. *Id.*

43. *Id.* at 109. The most oft-cited case is Robins Dry Dock & Repair Co. v. Flint, 275 U.S. 303 (1927) (prohibiting recovery against an entity that negligently damaged a vessel in port in an action by a time charterer for the inability to use a vessel while it was being repaired).

44. *See generally* Herbert Bernstein, *Civil Liability for Pure Economic Loss Under American Tort Law*, 46 AM. J. COMP. L. 111 (1998). Kenneth S. Abraham, *The Trouble with Negligence*, 54 VAN. L. REV. 1187 (2001).

45. *People Express Airlines*, 495 A.2d at 111.

46. *Id.* at 112.

47. *Id.*

48. *Id.* at 112-13.

A second category of exceptions, the New Jersey Supreme Court explained, involves recovery to persons in a "particularly foreseeable group, such as sailors and seamen, for whom the law has traditionally shown great solicitude."[49] In both sets of cases:

> courts "have found it fair and just,"
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> . . .
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> to impose liability on defendants who, by virtue of their special activities, professional training or other unique preparation for their work, had particular knowledge or reason to know that others ... would be economically harmed by negligent conduct. In this group of cases, even though the particular plaintiff was not always foreseeable, the particular class of plaintiffs was foreseeable as was the particular type of injury.[50]

The New Jersey Supreme Court described another category of cases where recovery of economic loss without physical harm was permitted as "cases akin to private actions for public nuisance."[51] Cases such as *Guste v. M/V Testbank*[52]

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49. 495 A.2d at 113.

50. *Id.*

51. *Id.*

52. 752 F.2d 1019 (5th Cir. 1985) (*en banc*). The Fifth Circuit decision involved the collision of a bulk carrier and a container ship in the Mississippi River Gulf outlet. *Id.* at 1020. The collision caused the release of hydrobromic acid to the air and the loss of 12 tons of pentachlorophenol into the river. *Id.* The outlet was closed for 19 days and all fishing, shrimping, and related activity was temporarily suspended in the outlet and four-hundred square miles of surrounding marsh and waterways. *Id.* A majority of the *en banc* court rejected claims for economic losses "by shipping interests suffering losses from delays or rerouting, marina and boat operators, wholesale and retail seafood enterprises not actually engaged in fishing, shrimping, crabbing or oystering in the area, seafood restaurants, tackle and bait shops, and recreational fishermen, oystermen, shrimpers, and crabbers." *Id.* at 1021, n.2. The Court of Appeals' majority determined that there must be physical damage or injury to a proprietary interest before a recovery for economic losses can be permitted. *Id.* at 1021. In the same breath, the Court of Appeals noted that the rights of commercial fishermen were not before the court and that "[a] substantial argument can be made that commercial fishermen possess a proprietary interest in fish in waters they normally harvest sufficient to allow recovery for their loss. Whether the claims of commercial fishermen ought to be analyzed in this manner or simply carved from the rule today announced, in the fashion of *Union Oil*, or allowed at all, we leave for later." *Id.* at 1027, n.10. Judge Wisdom wrote a vigorous dissent that rejected the policy arguments articulated by the majority, and suggested that the fear of unlimited liability was overdone: "The limitation imposed by 'particular' damages, together with refined notions of proximate cause and foreseeability, provides a workable scheme of liability that is in step with the rest of tort law, compensates innocent plaintiffs, and imposes the costs of harm on those who caused it." *Id.* at 1046 (Wisdom, Rubin, Politz, Tate, and Johnson, JJ., dissenting). Judge Wisdom's test focused not on the absence of a duty of care but instead on proximate cause, foreseeability, and "particular" damage: (1) "the damage must be proximately caused by the accident"; (2) allowable claims, under foreseeability rules, are only those "arising from activities in process at the time of the accident or [those] that can be proven with certainty"; and (3) damages mut be "particular" and distinguishable from those suffered by the general public. *Id.* at 1049.

and *Union Oil Co. v. Oppen*[53] were cited to illustrate the New Jersey Supreme Court's characterization of permitted recoveries "[w]here a plaintiff's business is based in part upon the exercise of a public right":[54]

> The theory running throughout these cases, in which the plaintiffs depend on the exercise of the public or riparian right to clean water as a natural resource, is that the pecuniary losses suffered by those who make direct use of the resource are particularly foreseeable because they are so closely linked, through the resource, to the defendants' behavior.[55]

As if to emphasize its point that the "no recovery for economic loss" rule had significantly eroded, the New Jersey Supreme Court then cited *Clay v. Jersey City*[56] where a lessee-manufacturer had to vacate its tenancy because Jersey City negligently failed to maintain the plaintiff's sewer line while repairs were being undertaken.[57] Damage to the physical premises was regarded as the claim of the owner.[58] The tenant's damages related solely to loss of use of the premises—"purely" economic loss.[59] Both were permitted, the court noted, adding that Jersey City "had had notice of the leak [for several years] and should have known about it even earlier."[60]

The New Jersey Supreme Court extracted two themes from its discussion of the exceptions to the rule that economic losses were not recoverable in a negligence action:

> 1. "[K]nowledge or special reason to know of the consequences of the tortious conduct in terms of the persons likely to be victimized and the nature of the damages likely to be suffered will suffice to impose a duty upon the tortfeasor not to interfere with economic well-being of third parties."[61]

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53. *Oppen*, 501 F.2d 558 (9th Cir. 1974). *Oppen* involved claims of commercial fishermen for economic losses resulting from an oil spill from Union Oil's Platform A in the Santa Barbara Channel in 1969. *Id.* at 559. The Court of Appeals determined that the claims were forseeable and, therefore, the commercial fishermen's claims were compensable under California negligence law despite the economic loss rule: "To assert that the defendants were unable to foresee that negligent conduct resulting in a substantial oil spill could diminish aquatic life and thus injure the plaintiffs is to suppose a degree of general ignorance of the effects of oil pollution not in accord with good sense." *Id.* at 569. The Court of Appeals explained that its holding was limited to commercial fishermen, and did "not open the door to claims that may be asserted by those . . . whose economic or personal affairs were discommoded by the oil spill of January 28, 1969." *Id.* at 570.

54. *People Express Airlines*, 495 A.2d at 113.

55. *Id.* at 114.

56. *Id.* (citing 181 A.2d 545 (N.J. Ch. 1962)), *aff'd*, 84 N.J. Super. 9 (App. Div. 1964).

57. *Id.* at 114.

58. *Id.*

59. *People Express Airlines*, 495 A.2d at 114.

60. *Id.*

61. *Id.* at 115.

2. "The foreseeability standard that may be synthesized from these cases is one that posits liability in terms of where, along a spectrum ranging from the general to the particular, foreseeability is ultimately found."[62]

The court imagined a fairness scale: "[t]he more particular is the foreseeability that economic loss will be suffered by the plaintiff as a result of defendant's negligence, the more just is it that liability be imposed and recovery allowed."[63]

The New Jersey Supreme Court then stated its holding:

> We hold therefore that a defendant owes a duty of care to take reasonable measures to avoid the risk of causing economic damages, aside from physical injury, to particular plaintiffs or plaintiffs comprising an identifiable class with respect to whom defendant knows or has reason to know are likely to suffer such damages from its conduct. A defendant failing to adhere to this duty of care may be found liable for such economic damages proximately caused by its breach of duty.[64]

The New Jersey Supreme Court "stress[ed]" that "an identifiable class of plaintiffs is not simply a foreseeable class of plaintiffs."[65] It explained, for example, that a sales person delayed in the conduct of business because a highway is closed due to a negligently caused accident may be a foreseeable plaintiff, but the presence of such a person in the area "would be fortuitous, and the particular type of economic injury that could be suffered by such persons would be hopelessly unpredictable and not realistically foreseeable."[66] Rather:

> An identifiable class of plaintiffs must be particularly foreseeable in terms of the type of persons or entities comprising the class, the certainty or predictability of their presence, the approximate numbers of those in the class, as well as the type of economic expectations disrupted.[67]

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62. 495 A.2d at 115.

63. *Id.* at 116.

64. *Id.* The New Jersey Supreme Court later explained:

> We do not mean to suggest by our recitation of these facts that actual knowledge of the eventual economic losses is necessary to the cause of action; rather, particular foreseeability will suffice. The plaintiff still faces a difficult task in proving damages, particularly lost profits, to the degree of certainty required in other negligence cases. The trial court's examination of these proofs must be exacting to ensure that damages recovered are those reasonably to have been anticipated in view of the defendants' capacity to have foreseen that this particular plaintiff was within the risk created by their negligence.

Id. at 118.

65. *Id.* at 116.

66. *Id.*

67. 495 A.2d at 116.

The court recognized:

> that some cases will present circumstances that defy the categorization here devised to circumscribe a defendant's orbit of duty, limit otherwise boundless liability and define an identifiable class of plaintiffs that may recover. In these cases, the courts will be required to draw upon notions of fairness, common sense and morality to fix the line limiting liability as a matter of public policy, rather than an uncritical application of the principle of particular foreseeability.[68]

If a duty is found to exist, that does not end the inquiry. *People Express* teaches further that "particular foreseeability" may also be employed to determine if the economic injury was proximately caused.[69] The kinds of considerations that were to be taken into account to determine whether economic losses were "particularly foreseeable and proximate" were listed by the court: "The economic injury was close in time and space; the defendant had ample opportunity to ascertain the identity and nature of the plaintiff's interests. Further, the amount of litigation and extent of liability was finite, rather than expansive."[70]

The New Jersey Supreme Court concluded its proximate cause analysis by holding that "a defendant who has breached his duty of care" to "particularly foreseeable plaintiffs may be held liable" for those economic losses that "are the natural and probable consequence of a defendant's negligence in the sense that they are reasonably to be anticipated in view of defendant's capacity to have foreseen that the particular plaintiff or identifiable class of plaintiffs . . . is demonstrably within the risk created by defendant's negligence."[71]

In applying this holding to the facts, the New Jersey Supreme Court determined that People Express was entitled to a trial on the merits.[72] What persuaded the court were, at least, the following facts:

(1) "the close proximity of the North Terminal and People Express Airlines to the Conrail freight yard";
(2) "the obvious nature of the plaintiff's operations and particular foreseeability of economic losses resulting from an accident and evacuation";
(3) "the defendants' actual or constructive knowledge of the volatile properties of ethylene oxide; and"
(4) "*the existence of an emergency response plan prepared by some of the defendants . . . which apparently called for the nearby area to be evacuated to avoid the risk of harm in case of an explosion.*"[73]

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68. 495 A.2d at 116.

69. *Id.*

70. *Id.* at 117

71. *Id.* at 118.

72. *Id.*

73. 495 A.2d at 118 (emphasis added). As a reminder, the emergency response plan was described in oral argument, and, by inference, was not a subject of briefing. *Id.* at 108. One might argue that this fact was essential to support the New Jersey Supreme Court's analysis.

It is this last foreseeability fact that takes on added future tort significance in the post-9/11 world of vulnerability assessments, risk assessments, and emergency response plans, as will be discussed below.

THE DUTY AND FORESEEABILITY LANDSCAPE AFTER 9/11

Palsgraf's determination that foreseeability is part of the calculus to determine the existence of a duty of care remains a subject of legal debate. Whatever one's view, a railroad employee who kicks what appears to be a stack of newspapers or improperly handles an innocent looking piece of abandoned luggage, but which actually contains an explosive that is thereby detonated, will after 9/11, generate a different analysis from the one that Judge Cardozo used in *Palsgraf.* Similarly, an individual carrying a seemingly mundane package which contains an explosive, who tosses it on a rail track below a platform on which there are standing dozens of people would prompt a different look by Judge Cardozo after 9/11 if there was no screening of packages under circumstances that warranted screening. Threats that were imagined—or more fairly, not imagined—months ago, now are the subject of daily newspaper stories.

Foreseeability is not a static concept, as *People Express* explained. It must have a context and that context will vary over time. Economic losses are grave matters. Even with the heightened burden of proof placed on People Express to prove proximately caused damages,[74] the erosion of the economic loss rule in the arena of the future terrorist tort could have debilitating consequences for defendants. Yet emergency plans to save lives and minimize the risk of harm may actually demonstrate the existence of "particular foreseeability" that could affect both the outcome of the "duty" inquiry and the presence or not of proximate cause for damages, especially if the response is not consistent with the plan.

What are the terrorist contexts against which planning is ongoing and within which future tort actions might be brought? September 11 has prompted unprecedented discussion of biological, chemical, radioactive, and conventional terrorist threats to human health and life and business continuity. These threats are described generally below.[75] These questions should be asked in considering each threat:

- Who is potentially at risk from the threat?
- What duty of care, if any, might be said to exist to those potentially at risk, and who owes that duty?[76]
- What is nature of the harm (physical injury or death, property damage, or economic losses)?

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74. *See* 495 A.2d at 113; *Clay*, 181 A.2d 545.

75. This discussion of terrorist threats is designed to be illuminating, not exhaustive.

76. This question and the discussion that follows is intended to exclude the perpetrators of a terrorist attack who would be liable parties under any standard.

- How particularly foreseeable is harm, should the duty be breached?
- Was the harm proximately caused by the breach of the duty?

CHEMICAL THREATS

Chemical threats take, at least, two forms: (1) direct attacks on persons using a chemical weapon and (2) direct attacks on the integrity of containers of stored chemicals (e.g., in tanks or pipelines) that are fixed in their location or are in transport.

The most famous and recent example of a direct attack on persons was the release of sarin in the Tokyo subways in 1995 by the Japanese cult, Aum Shinrikyo.[77] "Twelve people were killed and many more were injured. . . ."[78]

Sarin is one of a handful of chemical agents that challenge the limits of the threat assessment process. The 1999 GAO Report on Combating Terrorism evaluated the threat posed by chemical and biological weapons.[79] The following chart comes from Appendix I from this GAO Report and considers the likelihood that certain chemical agents will be used in a terrorist attack.[80] This chart and the entire GAO Report must be viewed in context, however. The report was limited to an evaluation of agents that could "cause mass casualties [in excess of 1,000] by means of improvised weapons or devices and not through contamination of water, food supply, agriculture, or livestock."[81] Plainly, any chemical (or biological) agent that is used in a location likely to result in less than 1,000 casualties is no less threatening .[82]

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77. GAO, Report, COMBATING TERRORISM: NEED FOR COMPREHENSIVE THREAT AND RISK ASSESSMENTS OF CHEMICAL AND BIOLOGICAL ATTACKS, NSIAD-99-163 at 4 (Sept. 7, 1999), *available at* http://www.gao.gov/terrorism.html [hereinafter 1999 GAO REPORT ON COMBATING TERRORISM].

78. *Id.* More deaths were not caused "because of the poor quality of the chemical agent and the dissemination technique used." *Id.*

79. *Id.* at 2.

80. *Id.* app. I at 28.

81. *Id.* at 10.

82. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at 9-10.

Chemical Agents[83]

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Choking Agents				
Chlorine[84]	Industrial product. No precursors required.	Not persistent.	Low.	Likely agent due to its availability as a commercial product.
Phosgene[85]	Industrial product. No precursors required.	Not persistent.	Low.	Likely agent due to its availability as a commercial product.

83. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. I at 28.

84. *Id.* "At room temperature, chlorine is a yellow-green gas with a pungent irritating odor." AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR) MEDICAL MANAGEMENT GUIDELINES, General Information: Chlorine 1, *at* http://www.atsdr.cdc.gov/mmg (last visited Sept. 9, 2002) [hereinafter ATSDR]. Its odor is detectable at concentrations below the OSHA permissible exposure limit so odor will serve as a warning. *Id.* Chlorine is used as bleach, and "as a chemical reagent in the synthesis and manufacture of [many products]." *Id.* at 2. "Chlorine reacts explosively or forms explosive compounds with many common substances such as acetylene, ether, turpentine, ammonia, fuel gas, hydrogen, and finely divided metals." *Id.* at 3. "The toxic effects of chlorine are primarily due to its corrosive properties." *Id.* at 5.

85. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. I at 28. "Phosgene is used as an intermediate in the [production of] isocyanates, polyurethane, polycarbonates, dyes, pesticides, and pharmaceuticals," among other chemicals. ATSDR, *supra* note 84, Phosgene at 2. " Phosgene is a colorless . . . liquid . . . and a colorless, nonflammable gas above 47° F. At low concentrations, its odor is similar to that of green corn or new-mown hay" ("musty" for those unfamiliar with such odors). *Id.* at 1. "[A]t high concentrations, its odor [is] sharp and suffocating." *Id.* " The odor threshold for phosgene is 5 times higher than the OSHA PEL [permissible exposure limit]" so odor would not provide a sufficient warning of hazardous concentrations. *Id.* Its irritating qualities can be mild and delayed, so exposure for a long period may result before the exposure is realized. *Id.*

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Nerve Agents[86]				
Tabun[87]	Not readily available manufacturing instructions, but precursors available. Relatively easy to manufacture.	Intermediate.	High.	Likely agent due to availability of precursor chemicals and relative ease of manufacture.
Sarin[88]	Moderately difficult and precursor chemicals are covered by the Chemical Weapons Convention (CWC).[89]	Not persistent.	High.	Likely agent due to demonstrated use by Aum Shinrikyo, but restrictions on precursor chemicals could create difficulties for production.

86. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. I at 28. "Nerve agents are the most toxic of the known chemical warfare agents. They are chemically similar to organophosphate pesticides and exert their biological effects by inhibiting" what are called "acetylcholinesterase enzymes" (thereby producing a toxic level of acetylcholine at nerve synapses which disrupts the transmission of nerve impulses). ATSDR, *supra* note 84, Nerve Agents at 1. The dose and route of exposure are important factors in analyzing the initial effects of nerve agents, but they are readily absorbed and fatal systemic effects can be rapid. *Id.* at 1. "Most of the nerve agents were originally synthesized in [the development of] insecticides, but because of their toxicity, they were evaluated for military use." *Id.* at 2. Tabun was synthesized in 1936 by a German scientist followed by sarin two years later. *Id.* Soman "was synthesized in 1944 by a German chemist, and VX was synthesized in the early 1950s by a British scientist." *Id.* "Nerve agents were used by Iraq against Iran" in their war. *Id.* "They are known to be included in military stockpiles of several nations, including the United States." *Id.* Reversal of nerve agent toxicity depends on the prompt administration of existing antidotes. *See also* Jeffrey L. Arnold, *Nerve Agents, G-Series: Tabun, Sarin, Soman*, 2 eMedicine Journal, No. 10 (Oct. 16, 2001), *at* http://www.emedicine.com/EMERG/topic898 (last visited Sept. 10, 2002); Fergus Nicoll, *VX - one drop is lethal*, BBC News, June 24, 1998, *at* http:// news.bbc.co.uk/hi/english/world/middle_east/119136.stm (last visited Sept. 11, 2002).

87. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. I at 28.

88. *Id.*

89. This Convention has been in force since April, 1997. "According to chemical experts, illegal acquisition of precursor chemicals would raise suspicions and attention due to the provisions of the convention." *Id.* at 11.

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Soman[90]	Difficult. Precursor chemicals controlled by CWC.	Intermediate.	High.	Not likely, due to difficulty of manufacture and control of precursor chemical.
VX[91]	Difficult to manufacture. Precursor chemicals controlled by CWC.	High.	Very high.	Not a likely agent due to difficulty of manufacture and control of precursor chemical.

Choking agents are widely available but are more likely to cause nausea or dizziness rather than death.[92] If panic can be caused in a large crowd, however, physical injury may result. Liquid chlorine stored in large quantities, however, has the potential to be quite lethal if released under the right conditions.[93]

Nerve agents are designed to attack the nervous system to stop a person's breathing.[94] Tabun, sarin, and soman are clear, colorless, and tasteless.[95] Tabun has a slight fruit odor.[96] Soman has a slight fruity or camphor odor but neither

90. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. I at 28.

91. *Id.*

92. *Id.*

93. Carol D. Leonnig & Spencer S. Hsu, *Fearing Attack, Blue Plains Ceases Toxic Chemical Use*, WASH. POST, Nov. 10, 2001, at A1. Wastewater treatment plants have large amounts of liquid chlorine on hand to treat raw sewage. *Id.* One such plant, the Blue Plains Wastewater Treatment Plant located southwest of Washington, D.C. four miles from the Capitol, removed 900 tons of liquid chlorine and sulfur dioxide stored at the plant after September 11. *Id.* "Jerry N. Johnson, general manager of the D.C. Water and Sewer Authority, which runs the plant," told the Washington Post "that the rupture of a full 90-ton tanker [of these chemicals] could spread a lethal cloud, which could kill people within 10 miles. . . ." *Id.* More than 2.7 million people live within a 15-mile radius of the plant. *Id.* Because of increased security costs, many utilities are following the example of Blue Plains in abandoning the use of liquid chlorine in favor of safer disinfectants. *Id.*

94. ATSDR, *supra* note 84, Nerve Agents at 6.

95. *Id.* at Nerve Agents at 3. The Centers for Disease Control and Prevention (CDC) has expedited efforts to develop rapid detection tools for more than "nerve agents, nitrogen mustard, hydrogen cyanide, toxic industrial chemicals, and other compounds that terrorists might use." *CDC Lab Placing Greater Emphasis on Anti-Terrorist Work, Official Says*, BNA DAILY ENV'T REP., Nov. 7, 2001, at A-5.

96. ATSDR, *supra* note 84, Nerve Agents at 3.

odor can be relied upon to provide sufficient warning against an attack.[97] VX gas was made by Saddam Hussein in Iraq.[98] It is amber-colored, tasteless and odorless, and possesses no warning properties.[99]

The 1999 GAO Report on Combating Terrorism explained that there are a number of precursor chemicals that have to be acquired and then used properly in a series of manufacturing steps before a nerve agent can be produced.[100] Some of these manufacturing steps are difficult and hazardous in and of themselves.[101] As a result, a "sophisticated laboratory infrastructure" would be required to achieve the "careful temperature control, cooling of the vessel, heating to complete chemical reactions, and distillation" to complete production of a nerve agent.[102]

In addition, distribution of the nerve agent in an outdoor environment subjects the attacker's likelihood of success to the effects of wind, heat or cold, sunlight, and moisture.[103] Hence, indoor attacks would be the most likely especially in places where large numbers of people congregate and are unable to disperse quickly.[104]

Suppliers of precursor chemicals, laboratory equipment manufacturers, laboratories handling chemical or choking agents, landlords,[105] persons associated

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97. ATSDR, *supra* note 84, Nerve Agents at 3.

98. *Iraq 'produced nerve gas warheads,'* BBC ONLINE NETWORK, June 24, 1998, *available at* http://news.bbc.co.uk/hi/english/world/middle_east/118934.stm (last visited Sept. 5, 2002). The BBC News reported that United Nations weapons inspectors in Iraq uncovered evidence that Iraq filled Scud missle warheads with VX. *Id.* Iraq's Deputy Prime Minister, Tariq Aziz, reportedly said that Iraqi scientists had experimented with VX but not could not turn it into a weapon. *Id.*

99. ATSDR, *supra* note 84, Nerve Agents at 3.

100. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at 12-13.

101. *Id.*

102. *Id.* at 11-12.

103. *Id.* at 13.

104. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at 13. The 1999 GAO REPORT ON TERRORISM also discusses (1) "blood agents": hydrogen cyanide (a "likely agent" whose precursor chemicals are covered by the CWC) and cyanogen chloride (a likely agent also); (2) "blister agents": sulfur mustard ("not likely" because of the difficulty to obtain precursor materials and moderate production problems), nitrogen mustard (HN-2 and HN-3) (same), and lewisite (same); and one other nerve agent: GF (not a likely agent due to the difficulty to manufacture it and the control of precursor chemicals by the CWC). *Id.* at app. I at 28-29.

105. The duty of care of landlords to tenants usually is addressed by "premises liability" torts. Generally speaking, the common law says that a landlord owes no duty of care to a tenant for the criminal acts of a third party. Tracy A. Bateman & Susan Thomas, *Landlord's Liability for Failure to Protect Tenant From Criminal Acts of Third Persons*, 43 A.L.R. 5th 207, 207 (1996). The doctrine is riddled with exceptions. *Id.* Contractual undertakings to protect a tenant are, of course, easy to comprehend. Other exceptions are muddled and typically, quite fact specific. They may involve a history of prior incidents, the voluntary assumption of providing security but doing so negligently, a "special relationship" that puts a burden on the landlord to provide adequate security, "special circumstances" or the totality of the circumstances generally, and the location of the criminal act

with the importation of goods, and sellers of devices that might be used to distribute chemical agents to harm others, would appear to be among the potential defendants in the chain of harm avoidance of a chemical terrorist threat.

BIOLOGICAL THREATS

Anthrax leads the list of biological weapons that can cause death and illness and disrupt business operations, especially because of the potential lag time between exposure to a biological weapon and detection of the attack.[106] Anthrax is not a contagious agent but its disruptive effects are obvious.[107]

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in common areas under a landlord's control, for example. Bateman & Thomas, *supra*. *See generally id.* (a comprehensive discussion of the cases throughout the United States); Melinda L. Reynolds, *Landowner Liability for Terrorist Acts*, 47 CASE W. RES. L. REV. 155, 162-180 (1996) (article also contains a discussion of some of the litigation that resulted from the 1993 attack at the World Trade Center at pp. 186-92); James H. Stilwell, *Texas Premises Liability Jury Definitions, Instructions, and Questions for Criminal Actor Cases—A Pattern to Ease the Madness?*, 17 REV. LITIG. 259 (1998); Donna Lee Welch, *Ann M. V. Pacific Plaza Shopping Center: The California Supreme Court Retreats From Its "Totality of the Circumstances" Approach to Premises Liability*, 28 GA. L. REV. 1053 (1994); Mark P. Buell, *Liability for Inadequate Security*, 69 FLA. B.J. 58 (March 1995). One has to wonder whether building owners that require identification as a condition of entry can now ever stop the practice. Or must they insure that the identification process is more than perfunctory, as is typically the case, and whether the failure to discover a terrorist who produced a fake driver's license to gain entry will be the basis for a future tort.

106. THE ADVISORY PANEL TO ASSESS DOMESTIC RESPONSE CAPABILITIES FOR TERRORISM INVOLVING WEAPONS OF MASS DESTRUCTION, THIRD ANNUAL REPORT TO THE PRESIDENT AND THE CONGRESS 32 (Dec. 15, 2001), *available at* http://www.rand.org/nsrd/org/nsrd/terrpanel/terror-screen.pdf (last visited Sept. 10, 2002).

> Because other surveillance methods often do not provide near real-time reporting, and because reporting can be critical for the prevention, recognition, and treatment of disease outbreaks, interest in early warnings through syndromic surveillance is growing. Syndromic surveillance relies on reports from pharmacies, hospitals, primary care medical providers, and others about syndromes or symptoms that may indicate an epidemic sooner than reports of specific diagnoses.

Id. The Report then described an innovative program in New York City where 11 hospitals report daily to the New York City Department of Health on the number of hospital admissions via the emergency department. *Id.* at n.59. Calls to 911 that can be related to influenza (based on experience) are also monitored. *Id.* The Advisory Panel pointed out that even New York's system cannot operate without good communications between medical and health entities: "The West Nile virus was first recognized not by the excellent syndromic surveillance systems in place in New York but by an astute infectious disease physician who had recently met the public health epidemiologist and called her when she saw three unusual cases of encephalitis." *Id.* at n.60. *See also* GAO REPORT ON HOMELAND SECURITY, *Challenges and Strategies in Addressing Short- and Long Term National Needs*, GAO-02-160T at 21 (Nov. 7, 2001) (discussing gaps in the nation's surveillance network).

107. David E. Rosenbaum, *Sterilized Mail To Be Scanned For Evidence*, N.Y. TIMES, Nov. 1, 2001, at B8. The anthrax mail bombs of the fall of 2001 caused nearly 70 tons of mail to be shipped to

Anthrax is on a list that includes a number of other bacterial agents as well as viral agents, as summarized in the following chart from the 1999 GAO Report on Combating Terrorism.[108]

BIOLOGICAL AGENTS[109]

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Bacterial Agents				

Ohio for decontamination. Rosenbaum, *supra.* The anthrax attack on the headquarters building of American Media Inc. publications in Boca Raton, Florida, resulted in anthrax spores spreading to the second and third floors of the building from the mail room on the first floor. Andrew C. Revkin & Dana Canedy, *Anthrax Pervades Florida Site, and Experts See Likeness to That Sent to Senators*, N.Y. TIMES, Dec. 5, 2001, at B5. The building was closed as a public health threat, and the contamination caused the death of the photograph editor and the near death of a mail room clerk. *Id.* In the Hart Senate Office Building where Senator Tom Daschle received the anthrax spore-filled letter, spores were "detected on the first, fifth, sixth and ninth floors and in filters in the heating and air conditioning system." David E. Rosenbaum, *Gas Will Be Used to Kill Bacteria in Senate Office Building*, N.Y. TIMES, Nov. 3, 2001, at B9. The building had to be closed for three months while the decontamination was planned and then implemented. Meredith Preston, *Superfund: Cost for Anthrax Cleanup in Congress Reaches $23 Million, EPA Tells Grassley*, BNA DAILY ENV'T REP., Mar. 7, 2002. As of March 6, 2002, EPA had incurred more than $23 million to address anthrax cleanup in U.S. Capitol buildings, the bulk of which was spent at the Hart Senate Office. *Id.* Meredith Preston & Linda Roeder, *White House Requests Supplemental Funds for Anthrax Cleanup Costs, Transportation*, BNA DAILY ENV'T REP., Mar. 25, 2002, at A-6.

108. 1999 GAO REPORT ON COMBATING TERRORISM, supra note 77, at app. II at 30. Generally the "problems and their solutions" to respond to any type of terrorist incident (command and control, planning and operations, resource management and logistics, communication, exercises, and mass casualties), and then those applicable to both biological and chemical terrorist events (public health surveillance, detection and risk assessment, protective equipment and training, chemical and biological-specific planning, hospital notice and decontamination, distribution of pharmaceuticals, vaccines and pharmaceuticals, laboratories, medical and veterinary coordination, and quarantine). GAO, Combating Terrorism: Considerations for Investing Resources in Chemical and Biological Preparedness, GAO-02-162T at 9-11 (Oct. 17, 2001).

109. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 30.

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Anthrax[110]	Virulent stock is hard to obtain and process.	Spores are very stable.[111] Resistant to sunlight, heat, and some disinfectants.	Very high for pulmonary anthrax.[112]	Possible, but requires sophistication to manufacture[113] and disseminate.[114]

110. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 30.

111. Anthrax spores were located in more than a dozen locations in Washington, D.C., and even turned up on equipment sent from Washington D.C. to Indianapolis for routine maintenance. Rosenbaum, *Sterilized Mail To Be Scanned For Evidence*, *supra* note 107, at B8. Anthrax spores were also found in a mail pouch sent from Washington to the United States embassy in Lithuania. *Id.* Four mail centers in New Jersey were closed and millions of pieces of mail were in limbo awaiting delivery. David W. Chen & Steven Greenhouse, *As Anthrax Cases Mount, the Tranquil Rhythms of Suburban Havens Are Disrupted*, N.Y. TIMES, Nov. 1, 2001, at B9. A laboratory worker was infected with skin anthrax in March 2002, by handling without gloves vials of spores collected from the attacks of the fall of 2001. *A Nation Challenged; New Case of Anthrax Is Tied to Bare Hands*, N.Y. TIMES, Apr. 5, 2002, at A8.

112. On November 9, 2001, the CDC published clinical details of the treatment of 10 patients who suffered from inhalation anthrax as a result of the contaminated letters sent to members of Congress and the news media in October 2001. Gina Kolata, *Anthrax Report Fixes on Victims' Stories*, N.Y. TIMES, Nov. 10, 2001, at B8. It seems clear that aggressive treatment (antibiotics, drugs to maintain blood pressure, ventilators to aid breathing, draining chest fluids, and compressing a patient's lungs) resulted in the survival of six of the 10 patients. *Id.*

113. This may not be true. William J. Broad, *Geographic Gaffe Misguides Anthrax Inquiry*, N.Y. TIMES, Jan. 30, 2002, at A11. The Ames strain of anthrax, which was used in the fall 2001, letter attacks, apparently is common in soils in Texas where old cattle trails would be likely areas to search for lethal spores. *Id.* As a result of a clerical error in a 1986 scientific paper, investigators had thought that the Ames strain had first been identified in Iowa. *Id.* In fact, it was found in Texas in the early 1980s. *Id.*

114. As much fear as was created by the anthrax letters of fall 2001, a more deadly form of distribution is through the intake system of building ventilation systems. James Glanz, *Report Sees Lower Towers That Can Empty Faster*, N.Y. TIMES, Mar. 28, 2002, at A15. Where a building intake is accessible and unmonitored, fine particles that carry anthrax and other biological or chemical agents can quickly spread if a filter system is not capable of stopping them. *Id.* (citing the chairman of a mechanical, electrical, and plumbing firm in Manhattan, the article explains that it can cost millions of dollars "to fully rework an existing building to filter out all biological and chemical agents, move and monitor intake vents, and keep internal air pressure just high enough to prevent terror agents from being sucked in through the small cracks around windows and doors").

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Plague[115]	Very difficult to acquire seed stock and to process.	Can be long-lasting, but heat, disinfectants and sunlight render it harmless.	Very high.	Possible but not likely, as it is difficult to acquire a suitable strain and to weaponize and disseminate it.

115. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 30. Plague is caused by a bacillus called *Yersinia pestis*. *Quick Facts About Plague*, *at* http://www.acponline.org/bioterro/plague.htm (American College of Physicians and American Society of Internal Medicine Web Page) (last visited Sept. 10, 2002) [hereinafter *Plague*]. A civilian working group has concluded that::

> [a]n aerosolized plague weapon could cause fever, cough, chest pain, and hemoptysis [(coughing of blood from the respiratory tract)] with signs consistent with severe pneumonia 1 to 6 days after exposure. Rapid evolution of disease would occur in the 2 to 4 days after symptom onset and would lead to septic shock with high mortality without early treatment. Early treatment and prophylaxis with streptomycin or gentamicin or the tetracycline or fluoroquinolone classes of antimicrobials would be advised.

Thomas V. Inglesby, M.D. et al., *Plague as a Biological Weapon: Medical and Public Health Management*, 283 JAMA 2281, 2281 (May 3, 2000).

> Given the availability of *Y pestis* around the world, capacity for its mass production and aerosol dissemination, difficulty in preventing such activities, high fatality rate of pneumonic plague, and potential for secondary spread of cases during an epidemic, the potential use of plague as a biological weapon is of great concern.

Id. Transmission of the plague has occurred through flea bites but, in the case of pneumonic plague, also by respiratory droplets. *Id.* Bubonic plague is the most naturally occurring form of the disease, but pneumonic plague is the greater fear in a bioterrorist attack. *Id.*

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Glanders[116]	Difficult to acquire see stock, moderately difficult to process.	Very stable.	Moderate to high.	Potential, but difficult to acquire, produce, and disseminate.

116. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 30. "Glanders is an infectious disease that is caused by the bacterium *Burkholderia mallei*." CDC, REPORT ON DISEASE INFORMATION, GLANDERS, *at* http://www.cdc.gov/ncidod/dbmd/diseaseinfo/glanders_g.htm (last visited Sept. 7, 2002). It primarily affects horses, donkeys, and mules. *Id.* The disease has not been seen in humans in the United States since 1945 but it is common in domestic animals in Africa, Asia, the Middle East, and Central and South America. *Id.* It "is transmitted to humans by direct contact with infected animals." *Id.* Human-to-human transmission has been reported as well. *Id.* Symptoms are a function of the route of infection. *Id.* Localized infections will develop in 1-5 days in a cut or scratch. *Id.* Pulmonary infections can result in pneumonia, pulmonary abscesses, and pleural effusion. *Id.* In the bloodstream, glanders infections are usually fatal within seven to 10 days. *Id.* Chronic infections involve "multiple abscesses within the muscles of the arms and legs or in the spleen or liver." *Id.* There is no vaccine available for glanders. *Id.* The mortality rate is over 50 percent even with antibiotics.

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Tularemia[117]	Difficult to acquire correct strain; moderately difficult to process.	Generally unstable in environment. Resists cold, killed by mild heat and disinfectants.	Moderate, if untreated, low if treated.	Possible, but difficult to stabilize.

117. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 30. "Tularemia was first described as a plague-like disease of rodents in 1911 and [was later] recognized as a potentially severe and fatal illness in humans." David T. Dennis, M.D. et al., *Tularemia as a Biological Weapon: Medical and Public Health Management*, 285 JAMA 2763, 2764 (June 6, 2001). Large waterborne outbreaks of the disease occurred in Europe and the Soviet Union in the 1930s and 1940s. *Id.* In technical terms, it is "a small, non-motile, aerobic, gram-negative coccobacillus." *Id.* at 2766. "In 1969, a World Health Organization expert committee estimated that an aerosol dispersal of 50 kg of virulent *F tularensis* . . . with five million inhabitants would result in 250000 incapacitating casualties, including 19000 deaths." *Id.* at 2764. This article presented the conclusions of a Working Group on Civilian Biodefense, summarized as follows:

> A weapon using airborne tularemia would likely result 3 to 5 days later in an outbreak of acute, undifferentiated febrile illness with incipient pneumonia, pleuritis, and hilar lymphadenopathy. Specific epidemiological, clinical, and microbiological findings should lead to early suspicion of intentional tularemia in an alert health system; laboratory confirmation of agent could be delayed. Without treatment, the clinical course could progress to respiratory failure, shock, and death.

Id. at 2763.

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Brucellosis[118]	Difficult to acquire seed stock; moderately difficult to process.	Very stable. Long persistence in wet soil or food.	Very low.	Not likely because of difficulty of getting stock, long incubation period and low lethality.

118. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 30. Brucellosis is caused by the bacteria of the genus *Brucella*. CDC REPORT ON DISEASE INFORMATION, BRUCELLOSIS, *at* http://www.cdc.gov/ncidod/dbmd/diseaseinfo/brucellosis_g.htm (last visited Sept. 7, 2002). These bacteria are usually passed among animals. *Id.* "Humans become infected by coming in contact with animals or animal products that are contaminated with these bacteria." *Id.* Symptoms are flu-like and may include fever, sweats, headaches, back pains, and physical weakness. *Id.* "Severe infections of the central nervous system or lining of the heart may occur." *Id.* In the United States, the disease is very uncommon with 100 to 200 cases occur per year. *Id.* But it is "very common in countries where animal disease control programs have not reduced the amount of disease among animals." *Id.* Humans are usually infected by eating or drinking something contaminated with the bacteria, inhaling the organism, or having the bacteria enter the body through skin wounds. *Id.* Person-to-person spreading of the disease is extremely rare. *Id.* Avoiding unpasteurized milk, cheese, or ice cream is a good way to avoid the infection. *Id.* There is no vaccine available for humans. *Id.* Antibiotics are typically used to treat the disease and recovery can take a few weeks to several months. *Id.* Mortality is usually less than 2 percent. *Id.* The Nuclear Threat Initiative (a foundation headed by Ted Turner) recently awarded a $1.3 million grant for three former Soviet laboratories in Russia to help develop a new vaccine against brucellosis, "which threatens animals in the United States and throughout the world." Judith Miller, *Turner's Foundation to Spend Millions to Fight Bioterrorism*, N.Y. TIMES, Nov. 25, 2001, at B7. Brucellosis has already received some publicity in connection with a potential bioterrorism attack. SUSPECTED BRUCELLOSIS CASE PROMPTS INVESTIGATION OF POSSIBLE BIOTERRORISM-RELATED ACTIVITY – NEW HAMPSHIRE AND MASSACHUSETTS, 1999, MMWR 2000 (June 16, 2000), *at* http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4923a1.htm (last visited Apr. 8, 2002) (reporting on a patient who may have been exposed "to 'laboratory flasks' and 'cultures' kept in her apartment by her boyfriend . . . a foreign national studying marine biology . . . [who] . . . had returned to his country of citizenship." No convincing evidence of terrorism was determined after a coordinated investigation by clinical, public health, and law enforcement personnel).

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Q Fever[119]	Difficult to acquire seed stock; moderately difficult to process and weaponize.	Stable. Persists for months on wood and in sand.	Very low if treated.	Not likely because of low lethality.

119. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 31. Query Fever is a bacterial "zoonosis" (it can be transmitted from animals to humans). UNIVERSITY OF FLORIDA, ENVIRONMENTAL HEALTH & SAFETY REPORT ON Q FEVER, *at* http://www.ehs.ufl.edu/Bio/qfever/qinfo.html (last visited Sept. 29, 2002). It is a relatively rare disease in humans. *Id.* The infection occurs throughout the world. *Id.* Q fever is spread through airborne dissemination of contaminated dust which is contaminated from the tissue or body fluids of animals infected with the bacteria or by direct contact with infected animals or materials that the animals have contaminated. *Id.* Person-to-person contact is regarded as unlikely. *Id.* In humans, Q Fever is usually asymptomatic lasting for less than two weeks after exposure (even without treatment) and can be mistaken for acute viral illness. *Id.* It produces fever, chills, headaches, malaise, and severe sweats. *Id.*

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Viruses[120]				
Hemorrhagic fevers (Ebola[121] and Marburg[122])	Very difficult to obtain and process. Unsafe to handle.	Relatively unstable.	Depending on strain, can be very high.	Unlikely because of difficulty of acquiring pathogen, safety considerations, and relative instability.

120. 1999 GAO REPORT ON COMBATING TERRORISM, *supra* note 77, at app. II at 31.

121. *Id.* Ebola is a fever that is often fatal. CDC REPORT ON EBOLA HEMORRHAGIC FEVER, *at* http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/ebola.htm (last visited Sept. 7, 2002). It occurs in humans and nonhuman primates. *Id.* It is named after a river in the Republic of the Congo where it was first recognized in 1976. *Id.* There are four species of Ebola; three have caused disease in humans. *Id.* Researchers believe that Ebola was originally transmitted from an animal to a human. *Id.* Confirmed cases of Ebola have been reported in the Republic of the Congo, Gabon, Sudan, the Ivory Coast, and Uganda. *Id.* "No case of the disease in humans has ever been reported in the United States." *Id.* Researchers believe that after the infection in humans occurs, the virus can be transmitted by direct contact with the blood or secretions of the infected person or through contact with objects such as needles. *Id.* Symptoms are not the same for all infected persons, but fever, headache, muscle aches, stomach pain, fatigue and diarrhea occur within a few days after infection. *Id.* Death can occur within one week of infection. *Id.* The immune response appears to dictate who survives the infection. *Id.* Early diagnosis is difficult because early symptoms are nonspecific to the virus and could be identified as being caused by a number of diseases. *Id.*

122. Marburg fever is a "rare, severe type of hemorrhagic fever which affects both humans and nonhuman primates." CDC REPORT ON MARBURG HEMORRHAGIC FEVER, *at* http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/marburg.htm (last visited Sept. 7, 2002). It is caused by a unique animal-borne RNA virus of the filovirus family which includes the four species of Ebola virus as its only other members. *Id.* It was first recognized in 1967 when outbreaks occurred in laboratories in Marburg and Frankfurt, Germany, and in Belgrade, Yugoslavia. *Id.* The infections came from exposures to monkeys or their tissues. *Id.* It is not clear how an animal host transmits the virus to humans, but once infected the virus can be spread by contact. *Id.* The virus incubates for five to 10 days before suddenly causing fever, chills, and headaches. *Id.* Symptoms become more severe over time and may include liver failure and severe hemorrhaging. *Id.* These symptoms are similar to other infectious diseases, such as typhoid fever or malaria, so diagnosis may be difficult, at least for an initial case. *Id.* The fatality rate is between 23-25 percent of those infected. *Id.*

	Ease of Manufacture	*Environmental Persistence/ Stability*	*Lethality*	*GAO Observations*
Smallpox[123]	Difficult to obtain stock and to process. Only confirmed sources are in the United States and Russia.	Very stable.	Moderate to high.	Questionable because of limited availability. But consequences of an attack are deemed especially serious.

While the 1999 GAO Report on Combating Terrorism characterized the anthrax risk as "possible," that assessment can no longer be held with a strong conviction. Indeed, fanciful distribution concepts may, one day, be tested.[124] And if a major anthrax attack occurs, the public health system's ability to respond to it will likely be controlled by the ability of personnel to collect specimens, the capacity of laboratories to analyze samples, the coordination of command functions, the quality of the communications,[125] and the challenge of storing large numbers of specimen samples for criminal prosecutions.[126] Future torts will

123. 1999 GAO REPORTING ON COMBATING TERRORISM, *supra* note 77, at app. II at 31.

124. The New York Times reported the discovery in the offices of a private relief organization in Kabul, Afghanistan, of documents discussing the history of anthrax and how anthrax can be spread through artillery shells, airplanes and trucks. Douglas Frantz & David Rohde, *2 Pakistanis Linked to Papers on Anthrax Weapons*, N.Y. TIMES, Nov. 28, 2001, at B1. Also found were "[p]lans for building a balloon and what appeared to be a rocket" . . . along with . . . empty steel tubes and parts of a rocket-propelled grenade. A container of helium sat on a work bench. *Id.* The article continued: "[t]he diagrams of the balloons seem to show a possible method for slowly dispersing some type of biological or chemical agent from the air. Words scribbled in the diagram appear to say 'cyanide.'" *Id.* One diagram showed "four balloons flying together in tandem with a box around them." *Id.* Crop dusting planes are a more likely target for a distribution device and, as a result, the entire pesticide application business is receiving greater scrutiny. Karen L. Werner, *States, Federal Government Sharing Data To Tackle Chemical Threats From Terrorists*, BNA DAILY ENV'T REP., Nov. 7, 2001, at A-8.

125. Lawrence K. Altman, *Preparation for Anthrax Is Called For*, N.Y. TIMES, Dec. 15, 2001, at B7 (reporting on the results of a two-day meeting at the CDC of health officials who expressed deep concern over the system's capacity to respond to an anthrax attack involving many more than the 18 cases that had been confirmed since October 2001).

126. *Id.* In connection with the post 9/11 anthrax bioattack, rugs, sets of china, jewelry, hundreds of envelopes, and hundred-dollar bills were among the items that had to be stored as a result of the criminal investigation, even though these specimens were found not to be contaminated. *Id.*

almost certainly look at negligent hiring practices at laboratories where anthrax research is being conducted.[127]

If the smallpox virus can be secured, it represents a genuine health threat. It is highly contagious and spreads rapidly.[128] It was eradicated in 1977 as a result of aggressive, worldwide public health strategies.[129] Hence, the World Health Assembly recommended in 1980 that vaccination programs cease.[130] The reappearance of smallpox today would require the theft of the virus from stockpiles in the United States[131] or Russia[132] and the ability of infected persons to spread the bacteria before succumbing themselves to its effects.[133] A civilian study group evaluating smallpox as a biological weapon reached this conclusion:

> If used as a biological weapon, smallpox represents a serious threat to civilian populations because of its case-fatality rate of 30% or more among unvaccinated

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127. Jim Yardley, *At an Anthrax Lab, the World Changed Quickly*, N.Y. TIMES, Nov. 21, 2001, at B6 (reporting on anthrax research laboratory security changes generally after 9/11, but noting proposed legislation that would require criminal background checks of foreign students working in the laboratories).

128. Donald A. Henderson, MD, MPH et al., *Smallpox as a Biological Weapon: Medical and Public Health Management*, 281 JAMA 2127, 2127 (June 9, 1999). "Smallpox spreads . . . primarily by droplet nuclei or aerosols expelled from the [mouths or nose] of infected persons and by direct contact." *Id.* at 2129.

129. *Id.* at 2128.

130. *Id.* Routine smallpox vaccinations were stopped in the United States in 1972. Lawrence K. Altman, *Plan for Smallpox Rules Out Mass Vaccination*, N.Y. TIMES, Nov. 27, 2001, at B7.

131. The CDC houses the United States' smallpox stockpile. Sheryl Gay Stolberg & Judith Miller, *Bioterror Role An Uneasy Fit for the C.D.C.*, N.Y. TIMES, Nov. 11, 2001, at A1. The building itself was reported to have been a target of one of the hijacked aircrafts on September 11. *Id.* Intergovernmental (federal, state, and local) communications as well as communications to health care providers in the case of a bioterrorist emergency is important. *Id.*

132. Henderson et al., *supra* note 128, at 2128.

133. "In people exposed to smallpox, the vaccine can lessen the severity of or even prevent illness if given within 4 days after exposure." CDC REPORT ON FACTS ABOUT SMALLPOX, *at* http://www.bt.cdc.gov/DocumentsApp/FactSheet/SmallPox/About.asp (last visited Sept. 7, 2002).

> The incubation period is about 12 days (range: 7 to 17 days) following exposure. Initial symptoms include high fever, fatigue, and head and back aches. A characteristic rash, most prominent on the face, arms, and legs, follows in 2-3 days. The rash starts with flat red lesions that evolve at the same rate. Lesions become pus-filled and begin to crust early in the second week. Scabs develop and then separate and fall off after about 3-4 weeks.
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> . . .
>
> Persons with smallpox are most infectious during the first week of illness, because that is when the largest amount of virus is present in saliva. However, some risk of transmission lasts until all scabs have fallen off.

Smallpox kills approximately one-third of the persons infected by it. *Id.* *See* Sheryl Gay Stolberg, *He Routed Smallpox, Now Tackles Bioterror*, N.Y. TIMES, Nov. 18, 2001, at B1.

> persons and the absence of specific therapy. Although smallpox has long been feared as the most devastating of all infectious diseases, its potential for devastation today is far greater than at any previous time. Routine vaccination throughout the United States ceased more than 25 years ago. In a now highly susceptible, mobile population, smallpox would be able to spread widely and rapidly throughout this country and the world.[134]

In June 2001, a hypothetical smallpox bioattack in shopping malls in Oklahoma City, Philadelphia, and Atlanta, dubbed "Dark Winter" by the exercise's organizers, was staged.[135] The attack was hypothesized to have occurred in December 2002 and infected 3000 people.[136] Taking into account the time it would take to diagnose the disease, how the numbers of infected persons would have increased before the realization of the attack had been confirmed, and assuming: (a) that doctors unfamiliar with the disease might not recognize it at first; (b) even vaccinated persons (from decades ago) would still be susceptible at some rate; (c) some geographic dispersion of infected individuals might occur; and (d) the difficulty of tracing the first persons infected, large numbers of persons rapidly became infected.[137] Six days into the hypothetical epidemic, 2,000 cases had been reported in 15 states, with 300 deaths.[138] After

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134. Henderson et al., *supra* note 128, at 2127. "Smallpox probably was first used as a biological weapon in the French and Indian Wars (1754-1767)" when British forces "distributed blankets that had been used by smallpox patients [to American Indians] with the intent of initiating outbreaks among [them]." *Id.* at 2128. More than 50 percent of the affected tribes died from the resulting epidemic. *Id.*

135. Tara O'Toole et al., *Shining Light on "Dark Winter,"* 34 CLINICAL INFECTIOUS DISEASES 972, 974 (2002), *available at* http://www.journals.uchicago.edu/CID/journal/issues/v34n7/020165/020165.web.pdf (last visited Sept. 10, 2002).

136. *Id.* at 973-74. It was estimated "as little as 30 g of smallpox could cause 3,000 infections." *Id.* at 974. The organizers noted that "the former Soviet Union was able to produce smallpox by the ton. . . ." *Id.* at 974.

137. *Id.* at 972-83.

138. *Id.* at 977. A key assumption in the exercise was that the United States had only 15.4 million doses of smallpox vaccine available to administer to persons so as to "ring" the infection areas and that only 12 million doses would actually be usable (due to inefficiencies and waste). *Id.* at 976. As the infection spread in the exercise, vaccine distribution decisions became critical ones. *Id.* at 974. The United States Government is rapidly trying to remedy this weakness. Sheryl Gay Stolberg, *U.S. Orders Vast Supply Of Vaccine For Smallpox*, N.Y. TIMES, Nov. 29, 2001, at B8. It has ordered 209 million doses of smallpox vaccine to supplement the stock of 15.4 million doses. *Id.* Recent tests have demonstrated that the U.S. stockpile can be diluted five times and still be effective. *Id.* Hence, the U.S. effectively has about 77 million doses and a stockpile of 286 million doses. *Id.* Aventis Pasteur Inc., the vaccines business of Aventis Pharma AG, announced on March 29, 2002, that it has an inventory of smallpox vaccine in the range of 75 to 90 million doses that it will be donating to the United States. Press Release, Aventis Pasteur, Aventis Pasteur Donates Approximately 75 to 90 Million Doses of Smallpox Vaccine to the U.S. (Mar. 29, 2002), http://www.aventis.com (last visited Sept. 7, 2002). The National Institute of Health will be running clinical studies to determine if the Aventis stockpile can be diluted without losing potency.

13 days, 16,000 cases were reported in 25 states and 1,000 people had died.[139] The public is demanding mandatory isolation of smallpox victims and their contacts, but the identification of victims has become a logistical impossibility.[140] The exercise was stopped at this point, but assuming a 1:10 smallpox transmission rate[141] on average, the worst case prediction by a fourth wave of infections was one million deaths from three million cases of infection after 68 days.[142]

State and local health departments' preparedness for a bioterrorist attack were a major component of the Dark Winter exercise and are a subject of great

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Stolberg, *supra* at B8. *See* Lawrence K. Altman, *New Options In Assault On Smallpox*, N.Y. TIMES, Apr. 2, 2002, at F5. In short, it appears that the vaccine availability crises that played a large role in the Dark Winter exercise has been significantly ameliorated. Of course, having vaccines to respond to a biological or chemical attack is just part of the problem. Getting the vaccines to the persons who need them is another challenge. The National Pharmaceutical Stockpile was created in 1999 to supply drugs and medical and surgical equipment quickly in areas impacted by a disaster, including a biological and chemical attack. Reed Abelson & Robert Pear, *Concerns About How Quickly The U.S. Can Deliver Drugs*, N.Y. TIMES, Oct. 30, 2001, at B8. A portion of the stockpile is organized in "12-Hour Push Packages" that can be delivered anywhere in the United States within 12 hours. GAO REPORT ON BIOTERRORISM, THE CENTERS FOR DISEASE CONTROL AND PREVENTION'S ROLE IN PUBLIC HEALTH PROTECTION, GAO-02-235T at 11 (Nov. 15, 2001). The first use of this system was on September 11, 2001. *Id.* The bulk of the stockpile, however, is held by manufacturers in what is called the "Vendor Managed Inventory." *Id.* It is designed to be made available within 24 to 36 hours after the vendors are notified. *Id.* To then get the stockpile where it needs to go presupposes that the nation's transportation system is operational and that there are skilled personnel at the destination location who can dispense the drugs with sufficient information to ensure that they are taken properly.

139. O'Toole et al., *supra* note 135, at 979.

140. *Id.* at 977. In the exercise, public order collapsed, state and federal officials disagreed over how to handle the situation and how to disseminate information, and the National Security Council was forced to consider the imposition of martial law. *Id.* at 978, 982. This result mirrored the confusion over coordination, communication, and science associated with the local, state, and federal response to the anthrax letters. Todd S. Purdum & Alison Mitchell, *Drills Predicted Gaps in Preparedness Seen in the Anthrax Response*, N.Y. TIMES, Oct. 21, 2001, at B7. In comparing the results of Dark Winter to the communication and information blunders of the handling of the anthrax attack, Governor Frank Keating of Oklahoma, who played himself in the Dark Winter exercise, called it a "horrific reprise." *Id. See also* Lawrence K. Altman, *U.S. Sets Up Plan To Fight Smallpox In Case of Attack*, N.Y. TIMES, Nov. 4, 2001, at A1.

141. O'Toole et al., *supra* note 135, at 974. The exercise authors looked at data from smallpox importation to Europe between 1958 and 1973, among other factors (including the covert nature of the attacks) to develop the estimate that the second generation cases would be in the range of 10 for every first generation case. *Id.* at 974-75. Even if the figure is high, it was regarded to be more sensible than using a lower rate that might result in misguided future planning assumptions (and therefore "would be irresponsible"). *Id.* at 975.

142. *Id.* at 975. The importance of knowledge, communication, coordination, planning, judgment, enough vaccine, and cooperation were emphasized in the lessons learned from the exercise. *Id.* at 979-82.

concern.[143] The following preparedness statistics were presented in an article[144] discussing the role of the CDC in the fight against bioterrorism.

Survey or Study Results	*Source*
80 percent of city and county health departments did not have comprehensive bioterror response plans in place and just more than one-half of the departments had such plans in development.[145]	National Association of County and City Health Officials, October 2001.[146]
65 percent of the CDC's email did not reach city and county health departments.[147]	CDC (based on a 1999 survey of city and county health departments).[148]
55 percent of city and county health departments did not have the capacity to send facsimile alerts to multiple recipients (doctors, health agencies, or the CDC itself).[149]	Same.[150]
20 percent of city and county health departments did not have e-mail capability.[151]	Same.[152]

143. O'Toole et al., *supra* note 135, at 972-83; GAO REPORT ON BIOTERRORISM, REVIEW OF PUBLIC HEALTH PREPAREDNESS PROGRAMS, GAO-02-149T at 12-15 (Oct. 10, 2001) (identifying weaknesses in three key areas of training of health care providers, communication among responsible parties, and capacity of laboratories and hospitals, including the ability to treat mass casualties). *See also Health Officials Put Cost of Germ-Warfare Defense at Almost Twice Bush Plan*, N.Y. TIMES, Nov. 30, 2001, at B8. The article explains that Dr. Jeffrey P. Koplan, director of the CDC, was seeking from the Congress an appropriation of $1.05 billion for state and local public health authorities and $628 million to buy and maintain a stockpile of smallpox vaccine.

144. Stolberg & Miller, *supra* note 131, at B10.

145. *Id.*

146. *Id.*

147. *Id.*

148. *Id.*

149. Stolberg & Miller, *supra* note 131, at B10.

150. *Id.*

151. *Id.*

152. *Id.*

88 percent of 186 hospitals in Washington, Oregon, Idaho and Alaska had no plan for attacks involving biological weapons, and 83 percent had no plan for attacks involving chemical weapons.[153]	1998 Study of 186 hospitals in Washington, Oregon, Idaho, and Alaska, Donald Wetter, U.S. Public Health Service, William Daniell and Charles Treser, University of Washington.[154]

Beyond issues raised by these results, adding laboratory capacity and hiring more epidemiologists to track disease are high on everyone's wish list.[155]

Among the potential defendants that might be associated with a biological or viral attack would be those: who make, install, maintain, own, operate, or have supervision for air-handling devices and filters used in such devices; landlords; services that open, handle, or distribute mail or packages; and entities, like laboratories, that employ individuals who can circumvent security procedures to sabotage legitimate research in order to do harm to others.[156]

RADIOACTIVE THREATS

The threat of a nuclear terrorist attack is terrifying but is limited by a number of logistical facts. A sophisticated weapon would have to be made somewhere. It does not seem likely that a country with sufficient industrial expertise would be willing to give safe harbor to terrorists to manufacture a nuclear weapon.[157]

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153. Stolberg & Miller, *supra* note 131, at B10. Shortages of extra beds, nurses, pharmacists, epidemiologists and medical technicians; lean inventories of medication; the absence of decontamination rooms or appropriate personal protective equipment; and the need for improved radio communication equipment or surveillance and detection equipment are among the deficiencies that afflict hospitals. Milt Freudenheim, *Few Hospitals Are Ready for a Surge of Bioterror Victims*, N.Y. TIMES, Oct. 26, 2001, at B8. Doctors in hospitals may be the first to recognize a subtle chemical or biological attack; hence, communications between the hospital and public health authorities are another major need. *Id.* (citing American Hospital Association estimates on the ability of urban hospitals to address mass casualties from a biological attack).

154. Stolberg & Miller, *supra* note 131, at B10.

155. *Health Officials Put Cost of Germ-Warfare Defense at Almost Twice Bush Plan*, *supra* note 143, at B8.

156. Such claims may involve an unsuitable employee that commits an intentional or negligent act outside the scope of his or her employment. *See, e.g.*, Ponticas v. K.M.S. Inv., 331 N.W. 2d 907 (Minn. 1983) (affirming a jury verdict against an apartment complex owner for the assault of a tenant in the tenant's apartment by the apartment complex manager who had a key to all apartments and was hired by the owner without a background check that would have revealed the manager's prior convictions for armed robbery, burglary, and receiving stolen property). Where there is a risk of an employee doing substantial harm to third parties, "the employer has the duty to use reasonable care to investigate his competency and reliability prior to employment." *Id.* at 913.

157. Al Qaeda apparently was unable to develop a nuclear capability and appears to have been swindled by black market sellers. Thom Shanker, *U.S. Analysts Find No Sign Bin Laden Had Nuclear*

Stealing a weapon is an alternative.[158] Russia is believed to have developed a "suitcase bomb" with yields perhaps equivalent to 1,000 tons of TNT, but detonation expertise would be still be required.[159] Theft of the "grapefruit-like" core of uranium might be easier to smuggle out of a country with nuclear bomb capabilities, than the bomb itself.[160] The bomb would then have to be constructed. Spent fuel rods or spent plutonium from a nuclear power plant also provide ingredients for a nuclear weapon if the fissionable uranium can be concentrated from the rods.[161] Or if plutonium can be separated from the rods, the bomb itself then can be built[162]

What is perhaps more realistic and economically frightening is the so-called "dirty bomb."[163] The concept is straightforward: pack radioactive material around an ordinary explosive and detonate the explosive in a location and manner that could spread radioactive dust from the explosion over as wide an area as possible.[164] The economic impacts could be catastrophic.[165]

The source materials are not difficult to identify. Radioactive cesium, cobalt, iridium, and strontium would be likely candidates.[166] They "are used to kill pathogens in food processing plants, as probes to test welds and pipelines and in many medical treatments."[167] Fortunately, each of these materials emits gamma rays, which are more intense than X-rays, so that proper detection equipment appropriately placed in densely populated areas or near important building locations might provide sufficient warning to thwart an attack.[168] Dirty bombs can be shielded with lead or other material that would block emissions that otherwise might be detected but that scenario presupposes that the bomb maker or user was able to avoid exposure and would be able to transport a shielded bomb without detection.[169] The Nuclear Regulatory Commission has

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Arms, N.Y. TIMES, Feb. 26, 2002, at A1.

158. Williams J. Broad et al., *Assessing Risks, Chemical, Biological, Even Nuclear*, N.Y. TIMES, Nov. 1, 2001 at A1.

159. *Id.* The Hiroshima bomb had an explosive equivalent of 15,000 tons of TNT. *Id.*

160. *Id.*

161. *Id.*

162. *Id.*

163. James Glanz, *Some See Panic As Main Effect Of Dirty Bombs*, N.Y. TIMES, Mar. 7, 2002, at A1.

164. *Id.*

165. *Id.* Scientists testified before the Senate Foreign Relations Committee on March 6, 2002, to the effect that the risk of serious personal injury or death from a dirty bomb attack is not high, but the potential for contaminating an area is great given the low-exposure limits set by the Environmental Protection Agency. *Id.* And if the limits are exceeded, evacuated areas may not become inhabitable or usable again until decontaminated, an expensive and time-consuming process, if structures can even be cost-effectively decontaminated. *Id.*

166. James Glanz, *Despite New Tools, Detecting Nuclear Materials Is Doubtful*, N.Y. TIMES, Mar. 18, 2002, at A13.

167. *Id.*

168. *Id.*

169. *Id.*

stated that an individual handling an unshielded cobalt rod "would receive a lethal (death within weeks) dose in about a minute, and an incapacitating dose (immediately deadly) in about 20 minutes. . . ."[170] If there is a legitimate concern over the theft of an atomic bomb, detection would be more difficult because atomic bombs do not emit much radiation and natural radiation may mask a detection reading.[171] Detecting atomic bombs will require the use of what is called a "neutron" detector.[172] Controlling access to materials that can be used to make or detonate a dirty bomb and protecting against the theft of a nuclear warhead or materials that might be used to make a nuclear weapon appear to be the best ways to prevent catastrophe.[173]

There is little doubt that the science of threat assessment will include a review of the safety of nuclear power plants[174] in the United States.[175] Spent fuel is of particular concern. Fuel is removed from the nuclear reactor after about three years.[176] One method of storage is to place the spent fuel in a spent fuel pool.[177] The spent fuel sits about 25 feet below the surface of the water.[178] The water shields radiation and carries off heat given off by the spent fuel.[179] Some argue that stopping the cooling process (removing the water or tampering with the water pumps for the spent fuel pool) has the potential to generate a fire that could disperse the radioactive materials from the spent fuel.[180]

Spent fuel is also housed outside the containment structure that houses the nuclear reactor in dry casks that are massive concrete and steel boxes filled with inert gas (thereby avoiding the problem of fuel leaking into the water in a spent fuel pool, or the failure of a spent fuel pool water pump).[181] The ability of these casks to withstand a breach in the event of a terrorist attack with conventional weapons is not clear.[182] A study by the National Council on Radiation

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170. Glanz, *supra* note 163, at A13.

171. *Id.*

172. *Id.*

173. *Id.*

174. "There are 103 commercial nuclear reactors that provide about 20 percent of the country's electricity." Suzanne Struglinski, *Nuclear Policy, Future of nuclear power may hinge on insurance renewal, panel says*, ENV'T & ENERGY DAILY, Jan. 24, 2002, *at* http://www.eenewsnet/EEDaily/searcharchive/test_search-display.cgi?q=%22Nuclear+Pol.html (last visited Sept. 19, 2002).

175. William J. Broad, *Scientists Find the New Field of Threat Assessment Full of Uncertainties*, N.Y. TIMES, Nov. 29, 2001, at B8. Raymond A. Zilinskas, a senior scientist at the Monterey Institute of International Studies, described a nuclear site that stored a small amount of plutonium that was protected by two barbed-wire fences, stones between the fences to thwart runners, television cameras, and spikes in the ground to prevent helicopters from landing. *Id.*

176. Matthew L. Wald, *Officials Fear Reactors Are Vulnerable to Attacks by Terrorists*, N.Y. TIMES, Nov. 4, 2001, at B8.

177. *Id.*

178. *Id.*

179. *Id.*

180. *Id.*

181. Wald, *supra* note 176, at B8.

182. *Id.*

Protections and Measurements suggested that breaching the storage cask of a spent fuel tank could create a radiation leak[183] larger than the release from a 10-kiloton nuclear weapon.[184]

Representative Edward J. Markey of Massachusetts cosponsored legislation that would require the United States to assume the obligation to provide security for nuclear reactors.[185] Mr. Markey believes that screening controls may be insufficient to prevent a terrorist from securing employment at a nuclear power

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183. Wald, *supra* note 176., at B8. The Nuclear Regulatory Commission is considering stockpiling potassium iodide to protect people against thyroid cancer that can result from exposure to radioactive iodine. Matthew L. Wald, *Agency Weighs Buying Drug to Protect Against Radiation-Induced Ailments*, N.Y. TIMES, Nov. 29, 2001, at B8. Potassium iodide saturates the human thyroid gland with normal iodine so it cannot absorb radioactive iodine that will emanate from the splitting of uranium atoms. *Id.* On December 10, 2001, the Food and Drug Administration issued new treatment guidelines for the use of potassium iodide to reduce the risk of thyroid cancer for persons exposed to hazardous levels of radiation. Matthew L. Wald & Andrew C. Revkin, *U.S. Changes Its Stance on Radiation Exposure Regimen*, N.Y. TIMES, Dec. 11, 2001, at B6. The FDA urged treatment with the drug as soon as an alert over possible exposure has been issued in contrast to emergency response plans in communities with nuclear power plants that provide that potassium iodide will be provided only to emergency workers. *Id.* It would seem essential that communities at greatest risk stockpile the drug and move quickly to dispense it, if necessary, because it takes three to four hours for a dose to become effective. *Id.*

184. Approximately 40,000 metric tons of spent fuel is stored outside the containment structure. Pam Belluck & Timothy Egan, *Cities and States Say Confusion and Costs Hamper the U.S. Security Drive*, N.Y. TIMES, Dec. 10, 2001, at B1. In New York, about 20 million people live within 50 miles of a single nuclear power plant. *Id.* "A draft study by the National Council on Radiation Protection and Measurements discussed the risk of shipping spent fuel and calculated that breaching a cask could produce a lethal radiation dose in an area of 2,700 square kilometers. In comparison, the study said, a 10-kiloton nuclear blast would produce those doses in 47 square kilometers." Wald, *Agency Weighs Buying Drug to Protect Against Radiation-Induced Ailments*, *supra* note 183, at B8. This calculation, however, is a function of assumptions made about the "size of the breach [in the cask] and the energy available to break up the fuel." *Id.* The United States was supposed to assume the obligation for disposing of private nuclear power plant spent fuel in 1998, but the implementation of this plan is many years behind schedule. *Id.* Yucca Mountain is the government's planned home for spent fuel. *Id.* But it is not likely going to house spent fuel any time soon as the controversy over its selection continues to brew. Katharine Q. Seeyle, *Foes of Nuclear Dump Gear Up Campaign*, N.Y. TIMES, Apr. 9, 2002, at A22 (discussing what will be a battle in the House and particularly the Senate over the plan to store spent fuel waste in Yucca Mountain, emphasizing transportation risks of hauling spent fuel to Nevada).

185. Matthew L. Wald, *Security at U.S. Reactors Criticized by Congressman*, N.Y. TIMES, Mar. 25, 2002, at A13. Current federal regulations require a nuclear power plant operator to be prepared to deal with "a determined violent external assault, attack by stealth or deceptive actions of several persons." Matthew L. Wald, *Nuclear Sites Ill-Prepared for Attacks, Group Says*, N.Y. TIMES, Dec. 17, 2001, at B6. "Several attackers" is assumed to be three attackers. "The attackers are to be assumed to have light weapons, a four-wheel drive vehicle and help from a knowledgeable accomplice in the plant." *Id.* There are no regulations for protections against attackers by air or by sea. Each plant is required to have "a minimum of five guards on duty at plants. . . ." *Id.*

plant and gaining unescorted access to controlled areas of such plants.[186] He also has said that apart from the vulnerability of storage casks, the reactors themselves may be vulnerable to a meltdown despite the presence of a containment structure if planes like those hijacked on September 11 were crashed into the containment.[187] He has even urged that antiaircraft weapons be deployed at reactor sites.[188]

CONVENTIONAL THREATS

Apart from the use of chemical, biological, or radioactive agents as weapons, there remains the September 11 approach: turning an aircraft filled with fuel into a flying bomb or variants on that theme involving conventional weapons or explosives and kamikaze terrorists. These threats raise a number of questions that future torts may have to address.

Building Designs. Engineers and other experts will debate the causes of the collapse of the World Trade towers, raising questions about whether future building designs will have to contain greater protection against terrorist attacks. Questions like the width of stairwells, the ability of sprinkler systems to withstand higher temperatures, the proper type of ventilation system and filtering capabilities will be asked.[189] Even the height of buildings[190] will be questioned in future building designs where possible terrorist attacks are taken into account.[191]

It also appears that future tort questions may be raised about the storage of fuel for emergency generators to serve a building's tenants in the event of a power failure. Fuel tanks are not unusual in buildings. Hospitals have them to power emergency generators, for example. The building known as 7 World Trade Center collapsed about seven hours after a fire was ignited from flammable

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186. Wald, *Security at U.S. Reactors Criticized by Congressman*, *supra* note 185, at A13.

187. *Id.*

188. *Id.*

189. Glanz, *supra* note 114, at A15. A study by the Construction Institute of the American Society of Civil Engineers considers the effect of 9/11 on building designs and discusses the importance of controlling access to intake vents in a building's ventilation system and filters to attempt to trap biological or chemical agents. *Id.*

190. *Id.* (Explaining that escape stairwells for a mass evacuation may have to be a certain width in tall buildings so as to render the building project uneconomic and require lower buildings—50 to 60 stories—to be the maximum height to safely evacuate tenants, if the need arises).

191. Fire testing for building materials is under attack as well. Eric Lipton & James Glanz, *Towers' Collapse Raises New Doubts About Fire Tests*, N.Y. TIMES, Apr. 8, 2002, at A1, A10 (explaining that fire tests are run in furnaces on building components but suggesting the sum of the whole may react very differently from its individual parts. Tests in the United States do not "account for plastic and synthetic combustible materials, which were unknown in the 1910's when the 'standard fire' used in the test was developed. Nor does the test try to mimic how a real fire sweeps through rooms in a building, creating structural stresses in one place that can lead to failures elsewhere in the building's interconnected skeleton." Computer tools are used in other countries to assist in designing buildings to withstand fires, the article also explains.).

material that poured down from the towers.[192] The building housed one tank holding 6,000 gallons of fuel to provide power to a generator.[193] There were four other tanks that contained 36,000 gallons of fuel to power other generators.[194] The fuel in these tanks apparently played a role in the ultimate collapse of the building.[195]

Evacuation Planning and Implementation. Evacuation planning may also become the subject of courtroom debate. It has been suggested that an announcement over the public address system in 2 World Trade Center that appeared to limit the danger to the first World Trade Center tower may have resulted in the failure of some to evacuate or the decision of some persons to use the elevators to exit instead of the stairs.[196] Battery powered lights in stairwells, glow in the dark paint, and good fire planning apparently made a difference in the success of the evacuations from the towers.[197] One tenant provided flashlights, masks and glow sticks to employees (they were strapped to office chairs in the event of an emergency).[198] And merely knowing where stairway doors were located from fire drills saved many lives in the chaos that followed the attacks.[199]

Communications. The importance of communications equipment in responding to a catastrophic event is another planning tool that will receive future scrutiny. In building fires, the reception of two-way radios is poor.[200] Within the World Trade Center towers, a device called a repeater was supposed to boost radio signals.[201] But the repeater failed (it was rendered inoperable by falling debris).[202] In addition, cellular phones and land lines were disrupted by the attacks so they were not viable alternatives.[203] Hence, fire department personnel were unable to properly communicate decisions about the danger of collapse of the structures and the proper deployment and tracking of personnel.[204]

The nation's phone system has become increasingly dependent on hubs that route voice and data traffic.[205] About 100 of these locations handle service for

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192. James Glanz & Eric Lipton, *Burning Diesel Is Cited in Fall of 3rd Tower*, N.Y. TIMES, Mar. 2, 2002, at A1 (that massive structure beams called transfer trusses were compromised by burning diesel fuel is a preliminary conclusion of investigators).

193. James Glanz, *Engineers Have a Culprit in the Strange Collapse of 7 World Trade Center: Diesel Fuel*, N.Y. TIMES, Nov. 29, 2001, at B9.

194. *Id.*

195. *Id.*

196. Dean E. Murphy & Clifford J. Levy, *The Evacuation That Kept a Horrible Toll From Climbing Higher*, N.Y. TIMES, Sept. 21, 2001, at B10.

197. *Id.*

198. *Id.*

199. *Id.*

200. Kevin Flynn, *A Focus on Communication Failures*, N.Y. TIMES, Jan. 30, 2002, at A11.

201. Jim Dwyer & Kevin Flynn, *Before the Towers Fell, Fire Dept. Fought Chaos*, N.Y. TIMES, Jan. 30, 2002, at A1.

202. *Id.*

203. *Id.*

204. Flynn, *supra* note 200, at A11.

205. Simon Romero, *Attacks at Hubs Could Disrupt Phone Lines*, N.Y. TIMES, Nov. 23, 2001, at

tens of millions of telephone lines.[206] Security concerns would involve not only access by employees or visiting technicians but also physical attacks on structures that were not built with terrorists in mind.[207]

Debris Removal and Management. A very practical consequence of a terrorist attack that generates debris is: what to do with it.[208] The Federal Emergency Management Agency (FEMA) has estimated that the World Trade Center attacks generated 1.4 million tons of waste.[209] Who will bear responsibility for proper disposal of debris, especially if it contains hazardous waste? FEMA has publicly stated that many city and state debris management plans are inadequate to address: the type and magnitude of waste from different disaster scenarios; the potential for the creation of hazardous wastes; how debris will be collected; priorities for collection, contract contingencies; and disposal locations.[210] Future torts will likely consider the responsibility for debris removal, the failure to plan, the inadequacy of plans, or the improper implementation of such plans in testing the reach of damage recovery.[211]

Seaports. Seaports pose unique concerns. About six million shipping containers are transported to the United States every year. About 2 percent of these containers are inspected[212] based on screening or profiling tools that are designed to detect anomalies in a shipping container. Customs inspectors are also equipped with equipment to detect radioactive emissions from a container. It would appear self-evident that a catastrophe at a seaport could have the potential of shutting down a huge component of global commerce while security requirements are being evaluated.[213]

B5.

206. Romero, *supra* note 205, at B5.

207. *Id.*

208. Gwendolyn Glenn, *Local Officials Need to Develop Plans For Disaster-Generated Debris, FEMA Says*, BNA DAILY ENV'T REP., Jan. 31, 2002, at A-3.

209. *Id.* This compares to the 15 million tons of waste created by Hurricane Andrew in South Florida in 1992 and the 120-140 million tons of debris resulting from the Newport-Inglewood, California, earthquake. *Id.*

210. *Id. See also* http://www.fema.gov (last visited Jan. 12, 2003).

211. The author was personally involved in litigation over the cleanup of contamination resulting from debris storage on a 100-acre interim disposal site (formerly used for farming) following Hurricane Andrew.

212. Peter T. Kilborn, *On the Dock, Holes in the Security Net Are Gaping*, N.Y. TIMES, Nov. 7, 2001, at B5. A pre-9/11 report by a government commission on crime and security at 12 major seaports in the United States which concluded (without identifying the ports) that only three of the ports tightly controlled access from the land and that access from the water was completely unprotected at nine of the ports. *Id.*

213. Sixty Minutes, CBS News, Mar. 24, 2002. The Maritime Transportation Antiterrorism Act of 2002, H.R. 3983, is currently working its way through the Congress. Among other things, H.R. 3983 addresses the development of "vulnerability assessments" for, and planning to deter and minimize damage from, a "catastrophic emergency"; development of vessel and facility antiterrorism plans; creation of "transportation security cards" for access to "secure area[s]" of a vessel or facility and controls over their distribution; creation of "maritime antiterrorism teams"; hiring requirements

Apart from containers, ships themselves can be used as weapons. Loss of life, physical injuries and the loss of the ship aside, blowing up a ship, generally, or to block a narrow shipping lane could wreak significant economic havoc.[214] Ports with major chemical or petroleum storage capabilities are an arguably inviting target.[215]

Things That Go: Buses, Trains and Trucks. Buses are not immune to security requirements. Greyhound Bus has painted a yellow line on the floor of its buses which may not be crossed by a passenger while a bus is in transit.[216] The front seats are no longer used for seating.[217] And talking with a driver while a bus is moving is prohibited.[218] Bags are also searched in some locations, and many drivers have been equipped with cellular phones to use on an emergency basis.[219]

Derailments of trains transporting hazardous chemicals are not new events. One post 9/11 derailment involved a 112-car train outside of Minot, North Dakota.[220] Fifteen of the cars contained anhydrous ammonia, a nitrogen-based product used in fertilizers, refrigeration, and household detergents, two or three of which leaked.[221] One person was killed and several injured as a result of the dispersal of the chemical.[222] Residents of several homes were within a one-mile

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for seaport employees; and development and maintenance of an "antiterrorism cargo identification and screening system" for containerized cargo and tracking requirements for cargo in containers entering the United States; and dissemination of crew and passenger manifests before arrival of a commercial vessel in the United States. A "catastrophic emergency" is defined as an "event caused by a terrorist act in the United States or on a vessel on a voyage to or from the United States that causes, or may cause, substantial loss of human life or major economic disruption in any particular area." "Terrorist act" is not defined. The bill has passed the Senate and is being considered in the House.

214. Joel Brinkley, *Tinderbox of a Texas Port Points to a Threat by Sea*, N.Y. TIMES, Mar. 5, 2002, at A10.

215. *Id.* Port Arthur, Texas, houses more than a dozen oil refineries and a number of plants that process volatile chemicals. *Id.* "Crude oil and . . . volatile liquids flow into the plants by ship, five tankers a day, on average, and by pipeline from Mexico and other points south." *Id.* There are 216 pipelines that run out of Port Arthur carrying gasoline, diesel fuel, butane, ethylene, benzene, propane, kerosene, and jet fuel among other products. *Id.* As one precaution against a terrorist attack at a port, the Coast Guard now requires cargo ships approaching the United States to relay detailed crew lists 96 hours before the ship reaches the United States. *Id.*

216. Jodi Wilgoren, *On the Greyhound Bus, Too, Life Changed After Attacks*, N.Y. TIMES, Nov. 10, 2001, at A1.

217. *Id.*

218. *Id.*

219. *Id.* On October 3, 2001, "a passenger slashed a driver's neck in Tennessee, causing a crash that killed six people" and stopped bus traffic nationwide for several hours. *Id.* A bus was used as the setting for a bomb in the movie, "Speed."

220. Linda Roeder, *Hazmat Transport Derailed Train Leaks Anhydrous Ammonia, Kills Man, Injures Others Near Minot, N.D.*, BNA DAILY ENV'T REP., Jan. 22, 2002, at A-9.

221. *Id.*

222. *Id.*

evacuation zone.[223] The cause of this derailment is being investigated by the National Transportation Safety Board.[224] If the cause was a terrorist act, what will be the future tort outcome?[225]

Hazardous material transport by truck poses its own unique set of challenges for transporter companies. The driver of the vehicle is, obviously, in the best position to create harm so it is not surprising that legislation has already been adopted to attempt to improve the licensing process.[226] The American Chemistry Council has published guidelines to assist companies and organizations in improving security for the transportation of hazardous materials.[227] The guidelines include the completion of a hazard assessment, exposure assessment, threat assessment, vulnerability assessment, and the development of a number of risk reduction steps.[228]

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223. Roeder, *supra* note 220, at A-9..

224. Linda Roeder, *Investigators Seek Cause of Derailment That Spilled Ammonia, Killing N.D. Man*, BNA DAILY ENV'T REP., Jan. 23, 2002, at A-9.

225. Certain activities are regarded as "ultrahazardous" and create strict liability irrespective of the cause. RESTATEMENT (SECOND) OF TORTS § 519 (1976). The rhetorical question in the text is directed at negligence, not strict liability actions, but where strict liability is imposed on an entity engaged in certain activities, especially where the gravity of the potential harm from an accident is very great, the security planning function is an enormously important one.

226. Uniting and Strengthening America By Providing Appropriate Tools Required To Intercept And Obstruct Terrorism (USA Patriot Act) Act of 2001, Pub. L. No. 107-56, 115 Stat. 272 (2002) provides that a state may not issue a commercial driver's license for transporting hazardous materials unless the Transportation Department has determined that the applicant poses no security risk. *Id.* It also requires states to check relevant criminal history of applicants and the citizenship status in the case of an alien applicant and to submit the information to the United States Department of Transportation. *Id.*

227. AMERICAN CHEMISTRY COUNCIL REPORT ON TRANSPORTATION SECURITY GUIDELINES FOR THE U.S. CHEMICAL INDUSTRY (Nov. 13, 2002).

228. *Id.* The guidelines follow a logical sequence. First, there is a prioritizing the chemicals transported with respect to their ability to harm people or the environment, or those which might "be prone to deliberate attacks or acts of sabotage," or their potential use of weapons, or in chemical or biological warfare, with special attention given to highly hazardous products, such as poison inhalation hazards, flammables or explosives. *Id.* at 6-8. Then a "risk review" is urged to establish a hazard assessment, an exposure assessment, a threat assessment, and a vulnerability assessment. *Id.* at 9-12. Risk reduction steps are then developed. *Id.* at 13. For example, shippers "should consider establishing partnerships with local law enforcement officials, emergency responders, and other public safety agencies along selected transportation routes." *Id.* at 14. Effective communication to shippers, carriers, customers, and other logical recipients, of problems (such as tampered security seals or equipment) is also urged. *Id.* A qualification of carriers in the chain of shipment is also recommended as is a "route and risk analysis on hazardous materials. . . ." *Id.* at 18. Finally, the guidelines caution that the risk assessment process is dynamic, not static, and should be conducted periodically. *Id.* at 20. The guidelines can be downloaded from the American Chemistry Council's Web page, http://www.acal.org/transecure.pdf (last visited Sept. 13, 2002).

Power/Sewage Treatment Plants. Attacks on utilities providing electricity[229] have the potential to be extraordinarily disruptive. Hurricane Andrew left some homeowners in South Florida without power for weeks.[230] But falling trees taking down power lines was the main culprit. A terrorist attack would have targets such as transmission towers and lines, and huge utility plant transformers, which could devastate economic activity on a local or regional scale.[231] The volatile nature of the disinfectant, liquid chlorine, and its potential to vaporize into a lethal cloud of poison, has made even the mundane business of sewage treatment the focus of considerable attention in the science of terrorist threat assessment.[232]

Water-Supply Systems. There are approximately 168,000 public water-supply systems in the United States.[233] The Environmental Protection Agency has argued that poisoning a water-supply system is not likely to have significant adverse health effects "because it would take 'a truckload' of poison . . . to

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229. The Justice Department's National Infrastructure Protection Center reported on January 30, 2002, that "[a] computer that belonged to an individual with indirect links to USAMA BIN LADIN contained structural architecture computer programs that suggested the individual was interested in structural engineering as it related to dams and other water-retaining structures." NATIONAL INFRASTRUCTURE PROTECTION CENTER (NIPC), INFORMATION BULLETIN: TERRORISTS INTEREST IN WATER SUPPLY AND SCADA SYSTEMS, 02-001 (Jan. 30. 2002), *at* http://www.nipc.gov/publications/infobulletins/2002/ib02-001.htm (last visited Sept. 5, 2002). The NIPC was established in February 1998, to serve as the United States Government's "focal point for threat assessment, warning, investigation, and response for threats or attacks against our critical infrastructures." NIPC, WELCOME, A MESSAGE FROM RON DICK, DIRECTOR OF THE NATIONAL INFRASTRUCTURE PROTECTION CENTER, *at* http://www.nipc.gov/about/about.htm (last visited Sept. 10, 2002). It has issued an advisory urging the Internet community to "apply common sense in deciding what to publish on the Internet" to minimize the risk that security concerns will be compromised. NIPC, ADVISORY: INTERNET CONTENT ADVISORY: CONSIDERING THE UNINTENDED AUDIENCE, 02-001, (Jan. 17, 2002), *at* http://www.nipc.gov/warnings/advisories/2002/02-001.htm (last visited Sept. 10, 2002). President Bush, in his State of the Union Address speech on January 29, 2002, said that "diagrams of American nuclear power plants and public water facilities" and "detailed instructions for making chemical weapons" were found among Al Qaeda documents in Afghanistan. President George W. Bush, State of the Union Address to Congress (Jan. 29, 2002), *at* http://www.whitehouse.gov/news/releases/2002/01/print/20020129-11.html (last visited Sept. 10, 2002).

230. Hurricane Andrew left this author without power for nearly two weeks.

231. Matthew L. Wald, *Electric Power System Is Called Vulnerable, and Vigilance Is Sought*, N.Y. TIMES, Feb. 28, 2002, at A13. Apparently, electric installations have been "under active physical surveillance" since September 11 based on reports received by the United States. *Id.* On March 25, 2002, federal immigration officials arrested Imran Mandai accusing him of a plot to bomb electric power plants in Florida. Judith Miller, *Pakistani Plotted to Bomb Florida Power Plants, Officials Say*, N.Y. TIMES, Mar. 26, 2002, at A13.

232. Leonnig & Hsu, *supra* note 93, at A1.

233. Katharine Q. Seelye, *E.P.A. Chief Tries to Calm Water Fears*, N.Y. TIMES, Nov. 10, 2001, at B5.

threaten public health."[234] On the other hand, the vulnerability of water-supply systems has yet to be fully evaluated and will not be completed quickly or cheaply.[235] The EPA has developed models to conduct "vulnerability assessments" for drinking water facilities, and has issued emergency response guidelines as well.[236]

Chemical Manufacturing or Storage Locations and Oil and Gas Pipelines. Chemicals in storage[237] or transport as well as chemical, oil, and gas pipelines[238] may be a more likely target of a terrorist attack. There are about 850,000 facilities in the United States that use hazardous or extremely hazardous chemicals.[239] There is little doubt that any facility that makes or houses dangerous chemicals is a potential terrorist target. Even before 9/11, Congress had ordered the Department of Justice to prepare a report on the vulnerability of chemical plants to a terrorist attack in 1999.[240] The American Chemistry

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234. Seelye, *supra* note 233, at B5. One witness before the House Science Committee argued in response to EPA's view that "[s]mall quantities of toxic chemicals, even if not directly harmful, may cause panic and great economic disruption." Mike Ferullo, *Security Bill Should Focus on Monitoring, Infrastructure Protection, Science Panel Told*, BNA DAILY ENV'T REP., Nov. 15, 2001, at A-1.

235. The Association of Metropolitan Water Agencies estimated that "it will cost an average of $550,000 to assess each of the nation's eight largest drinking-water systems, each [serving] at least 2 million customers." *$110 million for Vulnerability Assessments Included in House Anti-Terrorism Package*, BNA DAILY ENV'T REP., Nov. 23, 2001, at A-1.

236. U.S. ENVIRONMENTAL PROTECTION AGENCY, WATER INFRASTRUCTURE SECURITY, WHAT IS BEING DONE TO PROTECT THE NATION'S WATER INFRASTRUCTURE, *available at* http://www.epa.gov/safewater/security/index.html (last visited Sept. 7, 2002).

237. Apart from terrorist attacks, accidents do happen at chemical plants. *New York v. Diaz Chemical Corp.*, N.Y. Sup. Ct., No. 02-27601, Mar. 8, 2002 (requiring Diaz Chemical Corp. to pay on a temporary basis the lodging, meals, and laundry expenses of 15 families that had been evacuated from their homes in January 2002 after a chemical explosion at the company's plant in Rochester released a cloud of chemicals, including chlorofluorophenols and toluene, that resulted in the evacuation). *Court Orders Chemical Company to Pay Expenses for Residents Evacuated After Blast*, 48 BNA DAILY ENV'T REP., Mar. 12, 2002, at A-6.

238. Linda Roeder, *Transportation Department Removes Plans For Mapping Rule From Regulatory Agenda*, BNA DAILY ENV'T REP., Jan. 25, 2002, at A-6. After September 11, 2001, "the Office of Pipeline Safety [of the Research and Special Programs Administration of the Department of Transportation (DOT)] removed detailed information on the location of oil and gas pipelines from its Web site." *Id.* "[A] rule requiring natural gas and hazardous liquid pipeline operators to keep maps and records to show pipeline locations and other characteristics" was removed from the DOT's regulatory agenda as well. *Id.*

239. Amy E. Smithson, Prepared Statement Before the House Committee on Transportation and Infrastructure, Henry L. Stimson Center, (Nov. 8, 2001), *at* http://www.house.gov/transportation/water/11-08-01/smithson.html. Dr. Smithson recalled the methyl isocyanate accidental release in Bhopal, India on December 3, 1984 which killed about 3,800 persons and injured over 11,000. *Id.*

240. The Chemical Safety Information, Site Security and Fuels Regulatory Act, Pub. L. No. 106-40, 113 Stat. 212 (1999). *Suit Seeks to Force DOJ to Complete Report on Vulnerabilities of Chemical Plants*, BNA DAILY ENV'T REP., Mar. 13, 2002, at A-1. The request was due August 5, 2002, but

Council adopted "Site Security Guidelines for the U.S. Chemical Industry" on January 29, 2002, that makes enhanced security a mandatory condition of membership.[241] Council members were urged, among a number of "tools" offered for consideration, to inventory their assets ("people, information, and property") and to screen their assets to identify any vulnerabilities[242] that may require immediate attention, conduct a more detailed assessment of potential security weaknesses, decide what steps to take to improve security,[243] and utilize

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was not completed because of funding inadequacies. *Suit Seeks to Force DOJ to Complete Report on Vulnerabilities of Chemical Plants, supra.* Threat assessment methodologies for chemical companies are being developed by Sandia National Laboratory, the Center for Chemical Process Safety (part of the American Institute of Chemical Engineers), and the Synthetic Organic Chemical Manufacturers Association. Pat Phibbs, *Security Assessment Methods Developed By Justice Department, Private Organizations*, BNA DAILY ENV'T REP., Feb. 1, 2001, at A-7. "Sandia experts have tried to think like people who would want to harm [such] a facility, such as a disgruntled employee." *Id.*

241. AM. CHEM. COUNCIL ET AL., SITE SECURITY GUIDELINES FOR THE U.S. CHEMICAL INDUSTRY (Oct. 2001), *available at* http://www.americanchemistry.com (last visited Sept. 9, 2002) [hereinafter SECURITY GUIDELINES]. The introduction of the Chemical Security Act of 2001, S. 1602, on October 31, 2001, may have affected the promulgation of these guidelines. Chemical Security Act of 2001, S. 1602, 107th Cong. (1st Sess. 2001). S. 1602 requires EPA "to promulgate regulations to designate certain combinations of chemical sources and substances of concern as high priority categories based on the severity of the threat posed by an accidental release or criminal release from the chemical sources." *Id.* § 4(a)(1). "[E]ach owner and each operator of a chemical source . . . within a high-priority category" has a general duty "to identify hazards that may result from [a release], to ensure safer design and maintenance of the chemical source . . ., and to minimize the consequences of [a release]." *Id.* § 4(b). EPA is also given the authority to seek relief to abate "an imminent and substantial endangerment to the public health or welfare or the environment because of a potential accidental release or criminal release from a chemical source. . . ." *Id.* § 5. A "chemical source" is a stationary source, vessel, motor vehicle, rolling stock, or container "that contains a substance of concern." *Id.* § 3(3). A "substance of concern" is a hazardous substance, pollutant, or contaminant under CERCLA, and "petroleum, including crude oil and any fraction of crude oil." *Id.*

242. SECURITY GUIDELINES, *supra* note 241, at 5. Among others, the Security Guidelines offer this list of potential threats for consideration by a facility:

> [l]oss of containment, [s]abotage, [c]yber attack, [w]orkplace violence, [t]heft, [f]raud, [p]roduct contamination, [i]nfiltration by adversaries, [a]ttack on a chemical plant as part of chemical and biological terrorism, assault, . . . [h]acking into information systems to disrupt computer-controlled equipment causing an unplanned release of chemicals, [p]roduct tampering, "[h]ands-off threats" such as cutting off electricity, telephone, or computer network[s], or else contaminating or cutting off water, . . . [c]reation of destructive or hazardous conditions through modification of fail-safe mechanisms or tampering with valves (done in person or electronically from a distance).

Id. at 8.

243. *Id.* at 7. The Security Guidelines cite the arrest of "two anti-government militia members in Elk Grove, California, in connection with a planned attack [of] a facility where 24 million gallons of liquid propane were stored." *Id.* at 9. While company officials insisted the propane could not

a credible, independent party to verify the steps taken.[244] The Clear Air Act[245] requires that owners and operators of stationary sources:

> at which a regulated substance is present in more than a threshold quantity to prepare and implement a risk management plan to detect and prevent or minimize accidental releases of such substances . . ., and to provide a prompt emergency response [plan] to any such releases in order to protect human health and the environment.[246]

Future torts can be expected to examine hiring practices as well as security concerns and emergency response plans in evaluating the conduct of owners and operators of these types of facilities.

Cyberspace Attacks. Computer attacks have the potential to be extraordinarily disruptive. Computer systems are integral to the operation of telecommunications, the electric power grid,[247] water-supply systems, and air traffic, apart from the role that they play in every day business operations. Will future torts examine the reasonableness of not having alternative computer networks?[248] Will repeated probes looking for weaknesses in networks that are not protected by increased security create liability for economic damage resulting from the failure to increase security despite the history of probes?[249]

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have been detonated, after the arrests, the company added a number of security devices, "including a trench to protect the perimeter of the plant from a car-bomb attack . . . hir[ing] off-duty sheriff's deputies to help guard the facility and install[ing] a new, double-gated entrance to [prevent] unauthorized vehicle entry. The plant is [already] circled by a chain-link fence . . . with barbed wire [and] uses alarms and cameras" for continuous monitoring. SECURITY GUIDELINES, *supra* note 241, at 9.

244. *Id.* at 8.

245. 42 U.S.C. §§ 7401-7671. (2002).

246. § 7412(r)(7)(B)(ii). About 15,000 facilities are affected by this requirement. Phibbs, *supra* note 240, at A-7. § 7412(r)(1) provides that nothing in the section "shall be interpreted, construed, implied or applied to create any liability or basis for suit for compensation for bodily injury or any other injury or property damages to any person which may result from accidental releases of such substances."

247. Wald, *supra* note 231, at A13. Computers that control the electric power grid have been the subject of probes by unknown intruders. *Id.*

248. Alison Mitchell, *To Forestall a 'Digital Pearl Harbor,' U.S. Looks to System Separate From Internet*, N.Y. TIMES, Nov. 17, 2001, at B7. The United States is considering the need for a separate computer network to operate critical government services in the event that the Internet is disrupted. *Id.* In one survey with more than 2,000 respondents, 72 percent of respondents said that they had "no business continuity plans, have never tested their plan or their plan failed when they did test it. . . ." Marcelo Prince, *Disaster Preparedness a Top Priority of US Executives*, DOW JONES NEWSWIRES, Mar. 12, 2002, at WI-DJNS 15:51:00. One-third of the "respondents [had] a disaster recovery site with the computers and connections needed to run business from that remote location." *Id.* Only 39 percent had backup sites with sufficient computing capacity to last for more than a few days. *Id.*

249. John Schwartz, *Cyberspace Seen as Potential Battleground*, N.Y. TIMES, Nov. 23, 2001, at B5

Security Alerts. Tom Ridge, Director of Homeland Security, announced on March 12, 2002, a system of color-coded rankings to alert the nation to the level of risk of a terrorist attack.[250] The colors are red (severe risk of an attack), orange (high-risk), yellow (elevated condition and significant risk of an attack), blue (general risk), and green (low chance of an attack).[251] Will future tort claims take into account the color ranking in effect at a given time in evaluating the conduct of a defendant and the foreseeability of harm?

RESPONSES TO DAMAGE CLAIMS FROM TERRORIST ACTS

Where duty exists and damages are foreseeable, tort law still limits damages to those injuries proximately caused by a defendant's conduct. Before the World Trade Center towers and surrounding buildings disintegrated before the eyes of a nation and resulted in 3,000 deaths, conceptualizing damages in the tens or hundreds of millions of dollars was reserved for nuclear accidents[252] or huge oil spills.[253] After requiring individuals to function in spite of the grief over the loss

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(discussing "denial of service" attacks that are designed to slow a computer network so much that legitimate users are denied service).

250. Philip Shenon, *Color-Coded System Created To Rate Threat of Terrorism*, N.Y. TIMES, Mar. 13, 2002, at A16.

251. *Id.*

252. U.S. DEPARTMENT OF ENERGY REPORT TO CONGRESS ON THE PRICE-ANDERSON ACT, (Mar. 1999) [hereinafter PRICE-ANDERSON ACT REPORT]. The Price-Anderson Act is a 1957 amendment to the Atomic Energy Act of 1954 and provides for compensation in the event of a nuclear accident, including one involving terrorism. *Id.* at 1. The Price-Anderson Act was amended in 1988 and expired in August 2002. *Id.* at 5; H.R. 2983, 107th Cong. (1st sess. 2001). On November 27, 2001, the House passed H.R. 2983 which reauthorizes the Price-Anderson Act until August 2017. *Id.* Facilitated by the provisions of the Act, private insurance at each power plant is $200 million. PRICE-ANDERSON ACT REPORT at 14. If a nuclear incident occurs, an industry pool is created by the imposition of retrospective deferred premiums on each nuclear power plant. *Id.* at 16, n.39. The premium is $83.9 million per plant. *Id.* There are 110 plants, so that $9.23 billion is available through the industry pool. *Id.* When added to the $200 million in insurance for the plant where the incident occurred, a total of $9.43 billion is available (on the assumption that the retroactive premiums can be paid by each plant). *Id.* If damages exceed this total, Congress must decide how to proceed. *Id.* at 16. Department of Energy contractors are also indemnified under the Act. *Id.* *See also* Struglinski, *supra* note 174 (at a Senate Transportation, Infrastructure, and Nuclear Safety Subcommitee meeting in January 2002, one witness testified that a spent fuel pool fire could create $59 billion in damage.).

253. The Oil Pollution Act, 33 U.S.C. §§ 2701-2761 (2002) addresses liability for removal costs and damages for a discharge of oil into or upon the waters of the United States, adjoining shorelines, or the "exclusive economic zone," as well as natural resource damages; damages for injury to, or economic losses resulting from, destruction of real or personal property; damages for loss of subsistence use of natural resources; damages for the net loss of certain revenues and lost profits or impairment of earning capacity; and damages for certain net costs of increased public services. § 2702. If gross negligence or willful misconduct exists or there is a violation of a federal

of life, the specter of a terrorist attack shifts to the compensation of the persons or entities which have suffered damages and, how, if at all, they can be compensated for their losses.

STATUTORY COMPENSATION FUND AND LIMITATION OF LIABILITY TIED TO INSURANCE COVERAGE

Congress answered such questions following the 9/11 attacks, at least, by adopting two laws with relief provisions for airlines and victims, and limitation of liability clauses tied to the availability of insurance coverage. The first was the Air Transportation Safety and System Stabilization Act, (Air Safety Act) which became law on September 22, 2001.[254] Congress quickly followed the passage of the Air Safety Act with the passage of the Aviation and Transportation Security Act (Aviation Security Act)[255] on November, 19, 2001, which, among other things, broadened the limitation of liability established by the Air Safety Act.

The Air Safety Act provided relief to air carriers to compensate them for certain losses incurred as a result of the 9/11 attacks, subject to certain limits.[256] It provided for reimbursement of certain insurance cost increases for a limited time, as well.[257]

The Air Safety Act also created the "September 11th Victim Compensation Fund of 2001."[258] The Victim Compensation Fund is designed "to provide compensation to any individual (or relatives of a deceased individual) who was physically injured or killed as a result of the terrorist-related aircraft crashes of September 11, 2001."[259] A "Special Master" administers the Fund.[260] A claimant can request economic and noneconomic losses within two years after

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safety, construction or operating requirement, there is no limit on liability. § 2704(c). Otherwise, "the total of the liability of a responsible party," including removal costs with respect to each incident, "shall not exceed:" $1,200 per gross ton for a tank vessel; $10,000,000 if the vessel is greater than 3,000 tons; or $2,000,000 if the vessel is equal to or less than 3,000 tons. § 2704(a)(1)(A) and (B). For any other vessel, the limit is $600 per ton, or $500,000 whichever is greater. § 2704(a)(2). An offshore facility, except a deepwater port, has a limit of the total of all removal costs plus $75,000,000. § 2704(a)(3). Any onshore facility and a deepwater port have a limit of $350,000,000. § 2704(b). *See* Ballard Shipping Co. v. Beach Shellfish, 32 F.3d 623, 630-31 (1st Cir. 1994) (discusses scope of recovery).

254. Air Transportation Safety and System Stabilization Act, Pub. L. No. 107-42, 115 Stat. 230 (2001).

255. Aviation and Transportation Security Act, Pub. L. No. 107-71, 115 Stat. 597 (2001).

256. Air Transportation Safety and System Stabilization Act, §§ 103-104.

257. § 201(b)(1).

258. §§ 401-407. Congress also provided income tax and estate tax relief to 9/11 victims as well as anthrax victims. Victims of Terrorism Tax Relief Act of 2001, Pub. L. No. 107-134, 115 Stat. 2427 (2002).

259. § 403.

260. § 404(b).

regulations[261] are promulgated. The Special Master then determines eligibility and, for eligible individuals, determines the extent of harm, and the amount of compensation based on "the harm to the claimant, the facts of the claim, and the individual circumstances. . . ."[262] Punitive damages are not awardable and collateral compensation received by a claimant reduces the amount of compensation otherwise determined to be payable by the Special Master.[263] The Special Master has 120 days after a claim is filed to make this determination and provide written notice to the claimant.[264] The Special Master's determination is final and not subject to judicial review.[265]

Eligible individuals fall into two categories.[266] The first covers persons who were "present at the World Trade Center . . ., the Pentagon . . ., or the site of the aircraft crash at Shanksville, Pennsylvania at the time, or in the immediate aftermath, of the terrorist-related aircraft crashes of September 11, 2001," and who "suffered physical harm or death as a result of such an air crash."[267] The second covers flight crews on American Airlines flight 11 or 77, or United Airlines flight 93 or 175.[268] In return for such relief,[269] claimants waive their right to file in any court a civil action (or to be a party to an action) for damages sustained as a result of the 9/11 crashes.[270]

Congress also limited the liability of air carriers, airport sponsors, aircraft manufacturers, and persons with a property interest in the World Trade Center

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261. Victims of Terrorism Tax Relief Act of 2001 § 405(a)(3). The Final Rule contains a statement by the Special Master explaining changes to the interim rules in such areas as the treatment of collateral sources of funds and presumed awards. September 11th Victim Compensation Fund of 2001, 67 Fed. Reg. 11,233-11,397 (Mar. 13, 2002) (to be codified at 28 C.F.R. pt. 104).

262. § 405(b)(1)(B). The Special Master has explained the process for computing presumed economic loss. September 11th Victim Compensation Fund of 2001, 67 Fed. Reg. 11,235. The process is further described *at* http://www.usdoj.gov/victimcompensation/loss_calc.html (last visited Jan. 12, 2002).

263. § 405(b)(5) and (6).

264. § 405(b)(3).

265. *Id.*

266. § 405(c).

267. § 405(c)(2)(A)(i) and (ii). In the case of death to such an individual, the personal representative of the decedent becomes eligible. § 405(c)(2)(C).

268. § 405(c)(2)(B).

269. § 406(a). Payment must be authorized by the Special Master "[n]ot later than 20 days after the date on which a determination is made by the Special Master regarding the amount of compensation due a claimant. . . ." § 406(a).

270. § 405(c)(3)(B)(i). It also provides that the wavier "does not apply to civil actions to recover collateral source obligations." *Id.* § 405(c)(3)(B)(ii) provides that if an individual is a party to a pending civil action for damages sustained as a result of the 9/11 crashes, "such individual may not submit a claim under this title unless such individual withdraws from such action by the date that is 90 days after the date on which regulations are promulgated under Section 407," in other words, by 90 days after March 13, 2002. § 405(c)(3)(B)(ii).

to the amount of their insurance coverage.[271] The Aviation and Transportation Security Act, provides:

> Notwithstanding any other provision of law, liability for all claims, whether for compensatory or punitive damages . . . arising from the terrorist-related . . . crashes of September 11, 2001, against an air carrier,[272] aircraft manufacturer,[273] airport sponsor,[274] or person with a property interest in the World Trade Center, on September 11, 2001, whether fee simple, leasehold or easement, direct or indirect, or their directors, officers, employees, or agents, shall not be in an amount greater than the limits of liability insurance coverage maintained by that air carrier, aircraft manufacturer, airport sponsor, or person.[275]

New York City also received a limitation of liability.

> Liability for all claims, whether for compensatory or punitive damages or for contribution or indemnity arising from the terrorist-related aircraft crashes of September 11, 2001, against the City of New York shall not exceed the greater of the city's insurance coverage or $350,000,000.[276]

In addition, a claimant who seeks compensation from the Victim Compensation Fund "waives the right to file a civil action (or to be a party to an action) in any Federal or State court for damages . . . including any such action against the City of New York."[277]

One more limitation of liability was added by Congress in its post-9/11 review of litigation exposure scenarios. An individual who attempts "to thwart an act of criminal violence or piracy on an aircraft" is not liable for damages "in any action brought in a Federal or State court arising out of the acts of the individual"

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271. Aviation and Transportation Security Act § 201(b)(2).

272. "The term 'air carrier' does not include a person, other than an air carrier, engaged in the business of providing air transportation security." Air Transportation Safety and System Stabilization Act § 402(1), as amended by Aviation and Transportation Security Act § 201(d)(1).

273. An "'aircraft manufacturer' means any entity that manufactured the aircraft or any parts or components of the aircraft involved in the terrorist related aircraft crashes of September 11, 2001, including employees and agents of that entity." Air Transportation Safety and System Stabilization Act § 402(3), as amended by Aviation and Transportation Security Act, § 201(d)(3).

274. An "'airport sponsor' means the owner or operator of an airport (as defined in section 40102 of title 49, United States Code)." Air Transportation Safety and System Stabilization Act § 402(4), as amended by Aviation and Transportation Security Act, § 201(d)(4).

275. Aviation and Transportation Security Act § 201(b)(2)(a)(1). The limitation of liability for persons with a property interest in the World Trade Center does not apply, "if the Attorney General determines, after notice and an opportunity for a hearing on the record, that the person has defaulted willfully on a contractual obligation to rebuild, or assist in the rebuilding of, the World Trade Center." § 201(b)(2)(a)(2).

276. Air Transportation Safety and Stabilization Act § 408 (as amended by Aviation and Transportation Security Act § 201(b)(2)(a)(3)).

277. *Id.*

if the individual "reasonably believed that such an act of criminal violence or piracy was occurring or was about to occur."[278]

These statutory limitations on liability do not apply to civil actions to recover collateral source obligations, and the Congress explicitly stated that no other entity was receiving a limitation of liability:

> Nothing in this section shall in any way limit any liability of any person who is engaged in the business of providing air transportation security and who is not an airline or airport sponsor or director, officer, or employee of an airline or airport sponsor.[279]

Congress also created a federal cause of action "for damages arising out of the hijacking and subsequent crashes" of the four 9/11 aircraft and provided that this would be "the exclusive remedy for damages arising out of the hijacking and subsequent crashes of such flights."[280] It further provided that the law, including choice of law principles, of the State in which the crash occurred would be the substantive law for the decision in this federal action "unless such law is inconsistent with or preempted by Federal law."[281] Finally, jurisdiction was limited to the Southern District of New York for "all actions brought for any claim . . . resulting from or relating to" the 9/11 crashes.[282]

Of course, terrorism is easy to define for events like those which occurred on September 11, 2001. And insurance was already in place allowing for limitation of liability clauses tied to available "limits of liability coverage maintained" by the protected parties.[283] However, it appears that this insurance cannot be counted on in the future.

THE ADVENT OF THE TERRORISM EXCLUSION PENDING CONGRESSIONAL RELIEF

The insurance industry has reacted swiftly to address the risk of terrorism-related losses.[284] Reinsurers, who are vital in the insurance industry as an outlet

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278. 49 U.S.C. § 44903(h) (2002) (as amended by Aviation and Transportation Security Act § 144 (2002)).

279. Air Transportation Safety and Stabilization Act § 408(c) (as amended by Aviation and Transportation Security Act § 201(b)(3)).

280. § 408(b)(1).

281. § 408(b)(2).

282. § 408(b)(3).

283. § 408(a).

284. The traditional mechanism of loss protection is insurance, but where underwriters will not accept a risk, exclusions follow. *See generally* Richard J. Hillman, Statement Before House Subcommittee on Oversight and Investigations, *Terrorism Insurance: Rising Uninsured Exposure to Attacks Heightens Potential Economic Vulnerabilities*, GAO-02-472T at 3-4 (Feb. 27, 2002) [hereinafter Hillman Statement].

to spread risk especially for catastrophic losses,[285] are able to withdraw from assuming terrorism coverage risks, and they have rapidly done so.[286]

The disappearance of reinsurance shifts the risk of terrorism losses to primary carriers[287] and insureds. Primary carriers will begin introducing terrorism exclusions as comprehensive general liability policies come due.[288] The Insurance Services Office (ISO) quickly developed a terrorism exclusion after 9/11 and has successfully filed it with state insurance commission offices thereby permitting its use by primary insurers.[289]

The ISO's terrorism exclusion begins with a definition of "terrorism."[290] "Terrorism means activities against persons, organizations or property of any nature":[291]

1. That involve the following or preparation for the following:

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285. Hillman Statement, *supra* note 284, at. 3. Reinsurers are companies that acquire some of the risk assumed by primary insurers in return for a share in the premiums paid by insureds. *Id.* "[R]einsurance provides a way to insure large risks without exposing a single insurer to the possibility that its entire capital base would be wiped out because of a single event." *Id.*

286. Hillman Statement, *supra* note 284, at 2. In his Statement, Mr. Hillman explains that reinsurance contracts are not subject to regulation because they tend to be global in scope and involve sophisticated parties. *Id.* at 3. As a result, reinsurers are excluding terrorism coverage as reinsurance contracts come up for renewal. *Id.* at 4. A large share of these contracts are renewed in January. *Id.* So, he said, very little reinsurance coverage is being written although there are exceptions: industries or geographic locations where there is a perception that terrorism is unlikely "are the least affected." *Id.* Where coverage is available, however, the price is higher and the deductibles are larger. *Id.*

287. Hillman Statement, *supra* note 284, at at 4. Estimates as of February 2002 (the date of Hillman's statement) were that insurers had paid about $50 billion in losses as a result of the World Trade Center attacks and that reinsurers would ultimately pay about two-thirds of this sum. *Id.* at 8.

288. Hillman Statement, *supra* note 284, at 4-5, app. I. The GAO has reported on examples of property owners and developers who have been unable to acquire insurance for terrorism risks for existing properties, or can acquire it but at unaffordable prices. *Id.* at 10-14. It also has identified the early stages of concerns among borrowers who cannot acquire all-risks insurance to satisfy loan agreements, or prospective borrowers who have been unable to secure financing for property acquisitions because of the unavailability of affordable insurance. *Id.*

289. Hillman Statement, *supra* note 284, at app. I at 16. The ISO develops forms and endorsements for insurance contracts involving property and casualty coverage. *Id.* Once accepted by a state insurance commission, insurers are free to use them in policies being offered for sale in that state, as permitted by law. *Id.* As of February 22, 2002, 45 states, the District of Columbia, and Puerto Rico have approved the ISO's terrorism exclusion language which was developed in October 2001. *Id.* As of the same date, California, Florida, Georgia, Texas, and New York had not adopted the ISO terrorism exclusion. *Id.* at app. I at 17. "[T]hose five states account for more than 35 percent of the total U.S. commercial insurance market." *Id.* at 5.

290. Hillman Statement, *supra* note 284, at app. I at 17.

291. *Id.*

- Use or threat of force or violence; or
- Commission or threat of a dangerous act; or
- Commission or threat of an act that interferes with or disrupts an electronic, communication, information, or mechanical system; and

2. When one or both of the following applies:

- The effect is to intimidate or coerce a government or the civilian population or any segment thereof, or to disrupt any segment of the economy; or
- It appears that the intent is to intimidate or coerce a government, or to further political, ideological, religious, social or economic objectives or to express (or express opposition to) a philosophy or ideology.[292]

There is no "international" qualifier in this definition. The "effect" and "appearance" of "intent" terms along with the "furthering of objectives" or "expressions of a philosophy or ideology" language of paragraph 2 will be scrutinized by courts and be the subject of interesting evidentiary presentations if this language ever has to be interpreted (an event one hopes never has to occur).[293]

Assuming the definition of "terrorism" has been met, the ISO exclusion then has a number of ways to eliminate coverage for damages. The ISO terrorism exclusion says that the exclusion "only applies" if one (or more) of five exclusions are attributable to an incident of "terrorism."[294] There is a dollar exclusion, a number of deaths or serious injuries exclusion, and then three "type of weapon" exclusions.

Working in reverse order, the three "type of weapon" exclusions are:

(3) The "terrorism" involves the use, release or escape of nuclear materials, or directly or indirectly results in nuclear reaction or radiation or radioactive contamination; or

(4) The "terrorism" is carried out by means of the dispersal or application of pathogenic or poisonous biological or chemical materials; or

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292. Hillman Statement, *supra* note 284, at app. I at 17-18.

293. If a terrorist acts alone and is killed in the process and no organization claims responsibility, it is not clear how this language will operate. Even if an organization claims responsibility, it is not clear if it must be proven that the organization actually was behind the attack.

294. ISO TERRORISM EXCLUSION [hereinafter TERRORISM EXCLUSION] (on file with author).

(5) Pathogenic or poisonous biological or chemical materials are released, and it appears that one purpose of the "terrorism" was to release such materials.[295]

It is not clear what the difference is between "dispersal or application" and "release" although one explanation may be that Exclusion (4) involves the use of a biological or chemical material directly in an attack and Exclusion (5) involves the use of some other weapon that results in a release of biological or chemical materials unless "it appears" that "one purpose" of the "terrorism" was to achieve this result.

If none of the above exclusions is applicable, there is a dollar exclusion that reads:

(1) The total of insured damage to all types of property exceeds $25,000,000.[296] In determining whether the $25,000,000 threshold is exceeded, we will include all insured damage sustained by property of all persons and entities affected by the "terrorism" and business interruption losses sustained by owners or occupants of the damaged property. For the purpose of this provision, insured damage means damage that is covered by any insurance plus damage that would be covered by any insurance but for the application of any terrorism exclusions[.][297]

At a minimum, this exclusion will involve accountants and other experts in regard to terrorist acts that are on the dollar "cusp," particularly in evaluating "business interruption losses" of owners or operators "of the damaged property."[298]

The last exclusion involves the numbers of deaths or persons sustaining "serious physical injury":

(2) Fifty or more persons sustain death or serious physical injury. For the purposes of this provision, serious physical injury means:

a. [p]hysical injury that involves a substantial risk of death; or
b. [p]rotracted and obvious physical disfigurement; or

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295. TERRORISM EXCLUSION, *supra* note 294.

296. *Id.* From interviews with state insurance regulators and representatives of the National Association of Insurance Commissioners, the GAO learned that the primary motive for adopting the ISO exclusion was to protect insurer solvency which would be at risk without reinsurance. Hillman Statement, *supra* note 284, at 16. "NAIC officials [told the GAO] that the $25 million threshold was acceptable because it reflected the maximum losses that a single company could absorb[,]" adding that "losses of $25 million born[e] by a single insurer would threaten the solvency of 886 insurers representing approximately 44% of the [property/casualty] insurance companies writing commercial lines of insurance in the United States." *Id.* at 17.

297. There is a geographic component to the calculation of damages that would aggregate toward the $25 million. Hillman Statement, *supra* note 284, at 18. "For commercial property lines of insurance, insured damages to all types of property located in the United States and its territories and possessions, Canada, and Puerto Rico would be included. For commercial general liability lines of insurance, ISO officials said damages anywhere worldwide would be included." *Id.* at 18-19.

298. It is not clear whether property has to be physically damaged or whether an impairment of use for some period of time represents "damaged property."

c. [p]rotracted loss of or impairment of the function of a bodily member or organ; or[299]

If the "insured damage" is under $25,000,000 or under fifty deaths or persons with serious physical injuries, and exclusions (3)-(5) are not applicable, there will be coverage. If not, the ISO exclusion seeks to eliminate coverage, *including* coverage for the first $25,000,000 in damages and for the first fifty persons who die or suffer serious physical injury.

There are other three qualifications in the ISO exclusion:

> Paragraphs (1) and (2) immediately preceding, describe the thresholds used to measure the magnitude of an incident of "terrorism" and the circumstances in which the threshold will apply for the purpose of determining whether the Terrorism Exclusion will apply to that incident. When the Terrorism Exclusion applies to an incident of "terrorism", there is no coverage under this Coverage Part.
>
> In the event of any incident of "terrorism" that is not subject to the Terrorism Exclusion, coverage does not apply to any loss or damage that is otherwise excluded under this Coverage Part.
>
> Multiple incidents of "terrorism" which occur within a seventy-two hour period and appear to be carried out in concert or to have a related purpose or common leadership shall be considered to be one incident.[300]

The last of these three paragraphs will likely receive the most attention. It can be expected that, if the exclusion is invoked one day,[301] the words "appear to be carried out in concert or to have a related purpose or common leadership" will receive significant evidentiary attention if the "incidents" take place within 72 hours of each other.[302]

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299. TERRORISM EXCLUSION, *supra* note 294.

300. *Id.*

301. The GAO identifies another administrative consequence of the successful implementation of a terrorism exclusion. The claims mechanism established by insurance companies to deal with losses will be unavailable in the event of another terrorist attack that results in large numbers of casualties or deaths. Hillman Statement, *supra* note 284, at 8. "If, without insurers, the government should emerge as a principal source of financial recovery after another attack, it would first have to create the infrastructure to process claims and disburse financial assistance to victims, duplicating the mechanism already in place in the insurance industry." *Id.* at 8-9.

302. Insurance commission personnel in the five states that had not yet accepted the ISO exclusion for terrorism were concerned about the "low thresholds," the "all-or-nothing" nature of the thresholds; the aggregation of losses within a 72-hour period and across most of North America; fear that "the exclusion would leave some small and medium-sized businesses that could least afford the losses" totally unprotected; and "worry" that the definition of terrorism is "overly broad." Hillman Statement, *supra* note 284, at 5.

The use of the terrorism exclusion will have at least two state statutory limitations.[303] Laws in most states do not permit a workers' compensation insurer to exclude coverage for a particular type of event in a work setting, irrespective of the cause.[304] In addition, insurance laws in about 30 states require insurers to pay losses resulting from fire, again, irrespective of the cause.[305] Hence, if a terrorist explodes a bomb in a structure that results in a fire that then causes loss, the fire-related loss cannot be excluded depending upon the jurisdiction.[306]

The GAO reports that the terrorism exclusion proposed by the ISO was intended as an "interim solution to bring some level of certainty to the insurance marketplace while awaiting enactment of federal legislation."[307] The National

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303. Hillman Statement, *supra* note 284, at 6.

304. *Id.* at 6. Mr. Hillman stated that industry sources estimate "that approximately 10 percent of the losses resulting from the World Trade Center attack will be due to payments for workers' compensation claims." *Id.*

305. *Id.*

306. *Id.* Mr. Hillman notes that "[e]stimates suggest that that fire, rather than the [plane crashes themselves], caused a substantial portion of the losses in the World Trade Center attacks." *Id.* He also noted that "industry sources" report that they intend to seek legislative changes to these laws to permit the use of the terrorist exclusion. *Id.*

307. Hillman Statement, *supra* note 284, at 19. The decision in *Guste*, 752 F.2d 1019 (discussed *supra* note 52) was premised in part on the Court of Appeals' view that insurance was a preferable to negligence actions address claims for economic losses in the absence of a physical injury:

> With a disaster inflicting large and reverberating injuries through the economy, as here, we believe the more important economic inquiry is that of relative cost of administration, and in maritime matters administration quickly involves insurance. Those economic losses not recoverable under the present rule for lack of physical damage to a proprietary interest are the subject of first party or loss insurance. The rule change would work a shift to the more costly liability system of third party insurance. For the same reasons that courts have imposed limits on the concept of foreseeability, liability insurance might not be readily obtainable for the types of losses asserted here. As Professor James has noted, "[s]erious practical problems face insurers in handling insurance against potentially wide, open-ended liability. From an insurer's point of view it is not practical to cover, without limit, a liability that may reach catastrophic proportions, or to fix a reasonable premium on a risk that does not lend itself to actuarial measurement." [citation omitted]. By contrast, first party insurance is feasible for many of the economic losses claimed here. Each businessman who might be affected by a disruption of river traffic or by a halt in fishing activities can protect against that eventuality at a relatively low cost since his own potential losses are finite and readily discernible. Thus, to the extent that economic analysis informs our decision here, we think that it favors retention of the present rule.

Guste, 752 F.2d at 1029. Would the result have been different if first party insurance had not been available?

Association of Insurance Commissioners (NAIC) has recommended, therefore, "a sunset clause" for the exclusion: that its "approval be withdrawn fifteen days after the President signs into law a federal backstop to address insurance losses attributed to acts of terrorism, consistent with state law."[308]

WILL CONGRESS COME TO THE RESCUE?

Congress is considering such a "backstop." It is H.R. 3210, the "Terrorism Risk Protection Act," which was passed by the House of Representatives on November 29, 2001, and is being considered by the Senate.[309] As adopted by the House, H.R. 3210 proposes a "temporary risk sharing program" which is called the "covered period" and is to run to January 1, 2003, if the bill is adopted as written.[310] In brief, H.R. 3210 contains a "trigger" to activate relief.[311] This trigger determination is made by the Secretary of the Treasury who has to find that an act of terrorism[312] "has occurred during the covered period"[313] and "that

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308. Hillman Statement, *supra* note 284, at 19. If the terrorism exclusion permeates liability insurance policies as they are renewed in the coming months, reactive legislation similar to the Air Safety Act and Aircraft Security Act will not have an insurance platform to which to tie a limitation of liability if another major terrorism attack hits America.

309. Terrorism Risk Protection Act, H.R. 3210, 107th Cong. § 21 (2001). The Terrorism Risk Protection Act makes a finding that the disruption caused by the 9/11 crashes "threatens the continued availability of [U.S.] commercial property and casualty insurance for terrorism risk at meaningful coverage levels. . . ." § 2(4). To explain the consequences of this finding, H.R. 3210 says that the absence "of affordable commercial . . . insurance . . . threatens the growth and stability of the United States economy." § 2(5). Hence, "it is necessary to create a temporary industry risk sharing program to ensure the continued availability of commercial property and casualty insurance and reinsurance for terrorism-related risks. . . ." § 2(8).

310. H.R. 3210, §§ 2(8) and 20(a). It is temporary because insurance markets are resilient and "given time," the "private markets will diversify and develop risk spreading mechanisms to increase capacity and guard against possible future losses incurred by terrorist attacks. . . ." § 2(b) and (7).

311. § 5.

312. H.R. 3210, § 5(a). An act of terrorism is one that:

> (i) is unlawful; (ii) causes harm to a person, property, or entity in the United States, or in the case of a domestic United States air carrier or a United States flag vessel (or a vessel based principally in the United States on which United States income tax is paid and whose insurance coverage is subject to regulation in the United States), in or outside the United States; (iii) is committed by a person or group of persons or associations who are recognized, either before or after such act, by the Department of State or the Secretary as an international terrorist group or have conspired with such a group . . .; (iv) has as its purpose to overthrow or destabilize the government of any country, or to influence the policy or affect the conduct of the government of the United States or any segment of the economy of the United States, by coercion; and (v) is not considered an act of war, except that this clause shall not apply with respect to any coverage for workers compensation.

the aggregate insured losses resulting such occurrence or from multiple occurrences of acts of terrorism all occurring during the covered period," exceed certain dollar requirements.[314] If the trigger occurs, the Secretary of the Treasury provides financial assistance to qualifying insurers.[315] The total aggregate of financial assistance provided by H.R. 3210 is $100 billion,[316] although financial assistance provided by the United States to the insurance industry as a result of an occurrence in the covered period has to be repaid in part.[317]

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§ 19(1)(B). An act of terrorism is also is any act that the Secretary of the Treasury determines meets the requirements of Section 19(1)(B), "as such requirements are further defined and specified by the Secretary in consultation with the NAIC." § 19(1)(A). Section 13 of the bill provides that the National Association of Insurance Commissioners "in consultation with the Secretary, should develop appropriate definitions for acts of terrorism. . . ." § 13(a)(1). This language does not appear to cover an act of terrorism by a domestic group.

313. H.R. 3210 § 5(b)(2). Only the Secretary of the Treasury, "after consultation with the Attorney General of the United States and the Secretary of State" has the non-delegable authority to determine "whether (1) an occurrence was caused by an act of terrorism; and (2) [whether] an act of terrorism occurred during the covered period." § 5(b).

314. H.R. 3210 § 5(a). There is an "industry-wide trigger" of "industry-wide losses" that exceed $1,000,000,000, or an "individual insurer trigger" where "industry-wide losses exceed $100,000,000 and some portion of such losses for any single commercial insurer exceed– (A) 10 percent of the capital surplus [of that] insurer"; and "(B) 10 percent of the net premium written by [that insurer] that is in force at the time the insured losses occurred. . . ." § 5(a).

315. H.R. 3210 § 6. In the case of the industry-wide trigger, financial assistance consists of the "difference between . . . 90 percent of the amount of the insured losses of the insurer as a result of the triggering event involved; and $5,000,000." § 6(b)(1). In the case of an individual insurer trigger, financial assistance is available to each insurer where the insured losses exceed the $100,000,000, 10 percent of the capital surplus of that insurer, and 10 percent of the net premium written by that insurer that is in force at the time the insured losses occurred. § 6(b)(2). In these events, financial assistance is "equal to the difference between . . . 90 percent of the amount of the insured losses of the insurer as a result of [the] triggering event," and 10 percent of the net premium written by that insurer that is in force at the time the insured losses occurred. *Id.* If the individual insurer trigger is followed by an industry trigger, financial assistance is provided under the industry trigger and is to be provided as well in the amount of 10 percent of the net premium written by that insurer that is in force at the time the insured losses occurred. § 6(b)(3).

316. H.R. 3210 § 6(c).

317. § 7. There are two mechanisms for repayment: assessments and surcharges. § 6(e). Under § 7 of the bill, each insurer is subject to "assessments under this section for the purpose of repaying a portion of the financial assistance made available under section 6. . . ." §7(a). The "aggregate assessment" applicable to "all commercial insurers" is "equal to the lesser of – (1) $20,000,000,000; and (2) the amount of financial assistance paid under Section 6. . . ." § 7(b). H.R. 3210 sets a dollar limitation on the "the aggregate amount of an industry obligation" and contains a number of terms to administer the assessment program. § 7(c)(2). Section 8 provides for a surcharge on commercial property and casualty insurance policyholder premiums (on an annual basis, up to 3 percent of the insurer's net written premium) if the aggregate amount of financial assistance to a commercial insurer exceeds $20 billion. § 8.

In addition to this effort to preserve commercial property and casualty insurance, H.R. 3210 also proposes to manage litigation of claims relating to terrorist acts.[318] If a triggering determination is made, then there is a federal cause of action for resulting claims and this cause of action is the "exclusive remedy for claims arising out of, relating to, or resulting from such acts of terrorism."[319] Jurisdiction will exist in one or more federal district courts as determined by the Judicial Panel on Multidistrict Litigation, and the selected court or courts shall apply the substantive law, including choice of law principles, of the state in which the acts of terrorism occurred, "unless such law is inconsistent with or preempted by Federal law."[320]

A limitation on damages is provided for as well. No punitive,[321] exemplary, or other damages "not intended to compensate a plaintiff for actual losses may be awarded."[322] No prejudgment interest is permitted.[323] Rather, each defendant shall be liable:

> only for the amount of noneconomic damages[324] allocated to the defendant in direct proportion to the percentage of responsibility of the defendant for the harm to the plaintiff, and no plaintiff may recover noneconomic damages unless the plaintiff suffered physical harm.[325]

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318. H.R. 3210 § 15.

319. H.R. 3210 § 15(a)(1). The determination that one or more acts of terrorism has occurred is not subject to judicial review, takes effect upon publication in the Federal Register, and may be subject to change by the Secretary. § 15(a)(2). It is not clear what happens to a claim filed before the Federal Register notice is made.

320. §§ 15(a)(3) and (4).

321. § 15(a)(5)(A). Unless effectively barred by statute, punitive damages and associated due process questions will likely be the subject of post 9/11 future tort claims. For a recent case discussion on punitive damages, see Baker v. Exxon Corp., 270 F.3d 1215 (9th Cir. 2001) (vacating a $5 billion punitive damage award and remanding for a recalculation of punitive damages). *See also* Cooper Industries, Inc., v. Leatherman Tool Group, Inc., 532 U.S. 424 (2001); BMW of North America, Inc. v. Gore, 517 U.S. 559 (1996); Pacific Mutual Life Ins. Co. v. Haslip, 499 U.S. 1 (1991).

322. H.R. 3210 § 15(a)(5)(A).

323. *Id.*

324. H.R. 3210 § 15(a)(5)(B)(i). Noneconomic damages are defined as "losses for physical and emotional pain, suffering, inconvenience, physical impairment, mental anguish, disfigurement, loss of enjoyment of life, loss of society and companionship, loss of consortium, hedonic damages, injury to reputation, and any other nonpecuniary losses." § 15(a)(5)(B)(ii).

325. H.R. 3210 § 15(a)(5)(B)(i). Under Section 15(a)(6), any recovery by a plaintiff in an action under this subsection "shall be reduced by the amount of collateral source compensation, if any, that the plaintiff has received or is entitled to receive as a result of the acts of terrorism. . . ." § 15(a)(6). Enforced by a criminal penalty, attorneys fees are also limited to 20 percent of court ordered damages or a court-approved settlement. § 15(a)(7). The United States is given a "right of subrogation with respect to any claim paid by the United States. . . ." § 15(c). Judgments against a terrorist party can be satisfied by pursuing the frozen assets of the terrorist party, or any agency or instrumentality of that terrorist party unless the President determines otherwise in the interests of national security. § 15(e)(1)and (2). A terrorist party is a "terrorist, a terrorist organization, or

No one can say with any certainty how the Senate will finally treat the issue.[326]

CONCLUSION—A RETURN TO DUTY AND FORESEEABILITY

Imagine this news story:

> A suicide bomber entered a bustling mall filled with holiday shoppers and detonated a powerful explosive, killing himself and 23 bystanders, including two infants. The explosion caused a fire which spread rapidly through the fabric of the structure, eventually igniting a fuel tank containing thousands of gallons of diesel fuel stored for use in an emergency generator. Hundreds of shoppers were trapped in the fire and few escaped without severe burns. Ambulance sirens wailed throughout the day carrying the injured to makeshift emergency

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a foreign state designated as a state sponsor of terrorism under section 6(j) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)) or section 620A of the Foreign Assistance Act of 1961 (22 U.S.C. 2371)." § 15(c)(3)(A). "Terrorist" is not defined in the bill.

326. Seven months after this paper was presented, on November 26, 2002, H.R. 3210, as amended, became law when the President signed the Terrorism Risk Insurance Act of 2002 (TRIA). Section 105(a) and (b) of TRIA, respectively, nullifies any terrorism exclusion "in a contract for property and casualty insurance that is in force on the date of enactment of this Act" and voids any State approval of a terrorist exclusion, in both cases "to the extent that it excludes losses that would otherwise be insured losses." However, under Section 105(c), a terrorist exclusion may be reinstated if the insurer has received "a written statement from the insured that affirmatively authorizes such reinstatement." In addition, the exclusion can be reinstated if the insured "fails to pay any increased premium charged by the insurer for providing such terrorism coverage," and the insurer "provided notice, at least 30 days before any such reinstatement," of the increased premium and "the rights of the insured with respect to such coverage, including any date upon which the exclusion would be reinstated if no payment is received." Sections 103 and 108 of TRIA create a three-year Terrorism Insurance Program during which the federal government will become the "backstop" for insurance losses resulting from an act of terrorism up to certain limits, while the insurance industry develops systems and products "to create a viable financial services market for private terrorism risk insurance." TRIA, section 101(a)(6). During this period, section 107 of TRIA provides for an exclusive cause of action for claims for "property damage, personal injury, or death arising out of or relating to" an act of terrorism. Jurisdiction is limited to one or more federal district courts as determined by the Panel on Multidistrict Litigation. The substantive law, including choice of law provisions, for the State "in which such act of terrorism occurred" is the law for decision "unless such law is otherwise inconsistent with or preempted by Federal law." Unlike original H.R. 3210, TRIA as passed, does not contain a limit on punitive damages. Section 107(a)(5) instead provides that any amounts awarded for punitive damages "shall not count as insured losses for purposes of this title." Section 107(c) provides that the United States has a right of subrogation with respect to any payment made by the United States "under this title." How the private terrorism risk insurance market develops during the three-year federal program—in particular, what premiums are charged for what amount of coverage with what exclusions—will determine whether there will be meaningful insurance available to respond to an act of terrorism after the federal program expires.

> rooms. Store operators who watched helplessly as their businesses were incinerated were too shaken to even speculate about their economic losses, but it is likely that millions of dollars in merchandise was destroyed.[327]

If there is no terrorism insurance coverage, and if Congress is unwilling or unable to create exclusive relief funds or compensation funds, plaintiffs will look for ways to recoup losses from defendants against whom negligence claims can be made. In other words, if terror reigns, torts will follow.

Courts will then face the challenge of catastrophes: whether to compensate;[328] who to compensate; and how much to compensate; in an environment where insurance may not be available to absorb the risk. Inextricably bound up in these determinations are questions of duty and foreseeability in a post-9/11 world where assessments and response plans are essential tools to minimize harm to others. Returning to the discussion with which we began, with the stakes a whole lot higher, Judge Andrews's dissent in *Palsgraf* still rings true today:

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327. There is, obviously, a spectrum of attacks that might be labeled "terrorist." A suicide bomber that harms one person may be at one end of the spectrum. The theft of a nuclear weapon and its detonation in a major United States city would be at the gravest end of the spectrum. In between there is a whole range of scenarios that one might postulate and grade as to likelihood. It is the prospect of extraordinary damage demands for personal injuries and property damage and consequential damages that generates the most attention.

328. *See c.f.* Benefiel v. Exxon Corp., 959 F.2d 805, 807-08 (9th Cir. 1992) (rejecting claims of Californians who claimed they had to pay more for gasoline because of the Exxon Valdez oil spill because of the "remote and derivative damages" they claimed and lack of proximate cause as a matter of law); *Baker*, 270 F.3d at 1253 (9th Cir. 2001) (affirming summary judgment against "area businesses," "commercial fishermen outside the closed areas," "the aquaculture association," and persons claiming "stigma" damages as too remote as a matter of law, but remanding to the district court claims of "tenderboat operators and crews, and seafood processors, dealers, wholesalers, and processor employees" to permit them to attempt to establish damages that are not remote and speculative).

> It is all a question of expediency. There are no fixed rules to govern our judgment. There are simply matters of which we may take account. . . . There is in truth little to guide us other than common sense.[329]

329. 162 N.E. at 104 (Andrews, J., dissenting). Judge Kaufman invoked Judge Andrews' language in Kinsman Transit Company v. City of Buffalo, 388 F.2d 821 (2nd Cir. 1968) in denying relief to two claimants involved in "an unusual concatenation of events on the Buffalo River during the night of January 21, 1959. . . ." *Id.* at 822. A ship broke loose from its moorings, struck another ship, that broke loose from its moorings and drifted—followed by the first ship—until it crashed into the Michigan Avenue Bridge. *Id.* The bridge collapsed and the wreckage, together with the two ships, formed a dam which caused extensive flooding and an ice jam reaching nearly three miles upstream. *Id.* One plaintiff was under contract to deliver wheat that was stored on a ship in the Buffalo harbor but could not because of the obstruction and had to cover its obligation at a higher cost. *Id.* at 823. Another plaintiff's ship was struck by one of the drifting vessels, broke loose from the dock, and became entrapped by ice such that its cargo could not be unloaded without the aid of specialty equipment, thereby generating unexpected costs. *Id.* The Court of Appeals affirmed the district court's denial of relief but not because of the absence of a duty. *Id.* at 825. Rather, "[u]nder all the circumstances of this case," the connection between the negligence and the "damages is too tenuous and remote to permit recovery." *Id.*