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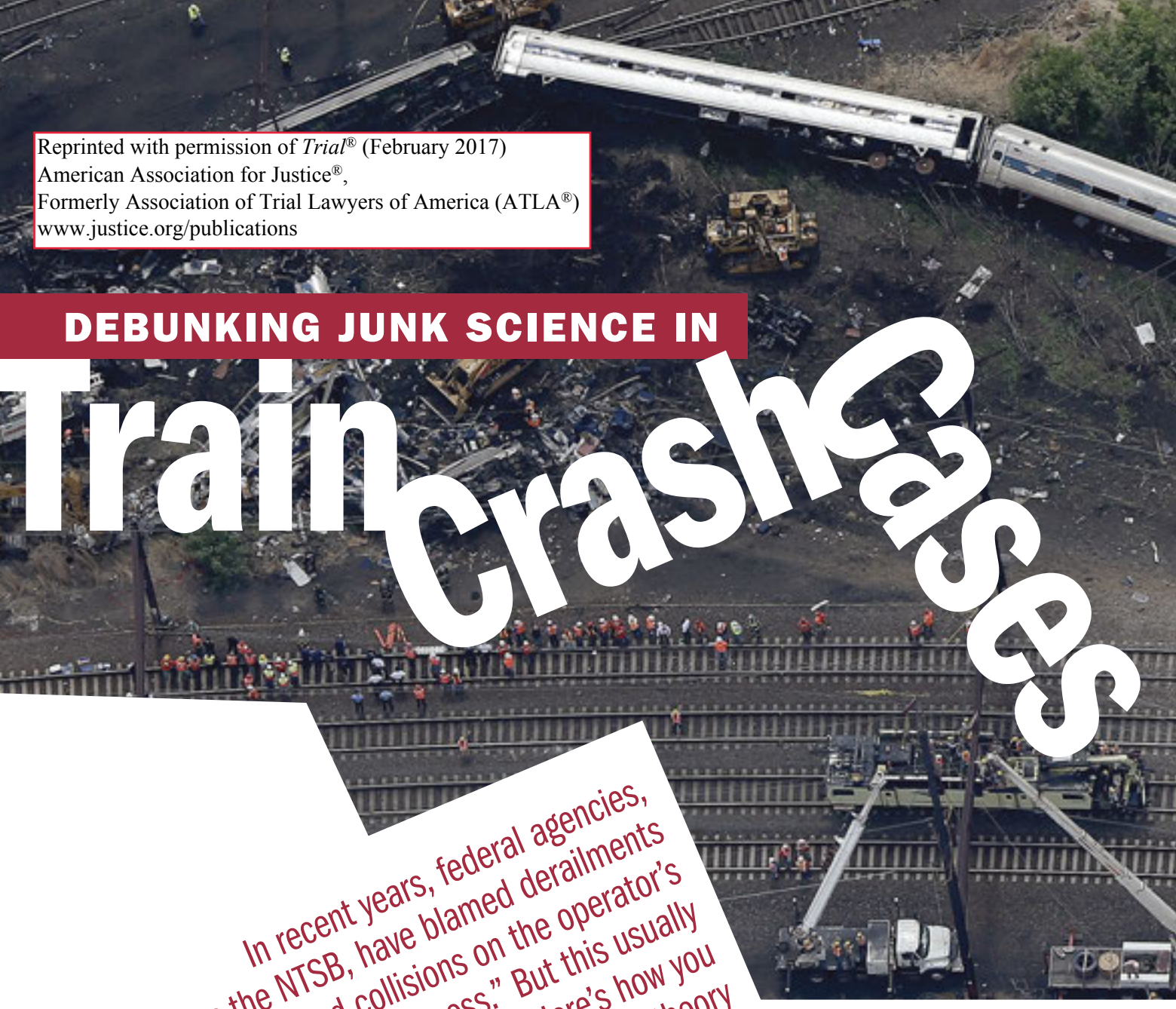

DEBUNKING JUNK SCIENCE IN

Train Crash Cases

In recent years, federal agencies, such as the NTSB, have blamed derailments and collisions on the operator's "loss of situational awareness." But this usually masks the true culprit—human error. Here's how you can discredit this highly controversial theory and prevent it from derailing your case.

By || **Patrick J. Fitzgerald**

On May 12, 2015, Amtrak Northeast Regional Train 188 derailed at a sharp curve just north of Philadelphia, killing eight passengers and injuring more than 200 others. After the crash, the National Transportation Safety Board (NTSB) conducted a year-long investigation, focusing on the engineer's acceleration—to twice the authorized speed—into the dangerous curve. It determined that the engineer's "loss of situational awareness" was the derailment's probable cause.[1]

Loss of situational awareness (SA) first gained academic interest in the 1990s. Although no scientific consensus on the definition of SA exists, it is informally described as knowing what's going on and what's going to happen next in a given circumstance. The NTSB defines the concept as "a person's perception of the elements in the environment within a volume of time and space, comprehension

Investigators and first responders work near the wreckage of Amtrak Northeast Regional Train 188 that derailed on May 12, 2015, just north of Philadelphia.

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of their meaning, and projection of their status in the near future."[2]

In recent years, the NTSB and other government agencies have increasingly used loss of SA as a favored explanation for crashes, derailments, and other transportation-related incidents. When an NTSB final report attributes the cause to an operator's loss of SA, this can harm a civil case by foreclosing viable theories of liability and limiting the available types of damages.

However, the loss of SA theory remains controversial and has been heavily criticized. Human factors psychologists and academics have condemned its use in causal analysis as pseudoscience—a finding of loss of SA is convenient but lacks scientific legitimacy or explanatory value. These experts criticize the theory as impossible to test or validate, and they argue that any conclusions derived from it are the result of hindsight bias and circular reasoning, rather than scientific analysis.[3]

And some experts reject the premise that a mental construct—a post-hoc description of a person's mental state—such as the loss of SA can cause a crash. Rather, they argue that loss of SA is simply a coded term for human error.[4]

When representing clients injured in train crashes and derailments (or similar transportation-related incidents), you should understand the loss of SA theory, how it may impact your case, and ways to exclude or undermine it in court.

Avoiding liability. If the NTSB concludes that an operator's loss of SA caused a crash, it is easier for common carriers and other companies to evade civil liability. The NTSB's final report and probable cause determination will provide a legal roadmap for opposing counsel to use as a defense. They can repeat or draw on the NTSB's theory to paint an operator's conduct as innocent and relatable—arguing that the operator's error was merely an inevitable, forgivable mental lapse.

In cases involving distraction or urgent circumstances, defense counsel may even argue that the operator's conduct or inaction was reasonable under the sudden emergency doctrine.[5] With an NTSB endorsement and a remorseful, likable operator, these arguments become more credible.

Punitive damages. An NTSB loss of SA causal determination may also block a claim for punitive damages because it frames the operator's conduct as unintentional, rather than conscious or reckless. This makes it considerably more difficult, if not impossible, to meet the punitive damages threshold, which requires a showing of reckless, intentional, or wanton and willful conduct.

The loss of SA determination also places primary responsibility for the incident on the operator, shifting focus away from alternative avenues for punitive liability—particularly the actions and conduct of the operator's employer.

Other punitive facts that may be marginalized or deemed inconsequential include: the omission of safety technology or systems designed to prevent similar incidents (notably, positive train control in train crash cases); or other company actions that could have prevented the crash, such as its training of operators or its deficient safety policies and procedures.[6]

Admissibility. Although an NTSB final report's opinions and conclusions are generally inadmissible, the loss of SA theory still may find its way into the courtroom.[7] For example, the NTSB's *factual* reports—generated by investigators and relied on by board members—are admissible, and jurors often view them as authoritative and unassailable.[8] These factual reports may reference the loss of SA theory or imply that it caused the incident.

NTSB investigators' deposition testimony also is admissible at trial, which may buttress defense arguments that an operator's loss of SA played a role in the collision or derailment.[9] Defense experts rely on the NTSB final report's factual findings and then, unsurprisingly, reach the same or a similar conclusion as the agency regarding the underlying cause.[10]

Use motions in limine to prevent the loss of SA theory from being introduced at trial. Several courts have excluded NTSB reports or the causal opinions they express, reasoning that such evidence falls within the proscription against admitting NTSB final accident reports.[11]

USE MOTIONS IN LIMINE TO PREVENT THE LOSS OF SITUATIONAL AWARENESS THEORY FROM BEING INTRODUCED AT TRIAL.

Also consider filing a motion to exclude or limit expert testimony promoting the loss of SA theory. Emphasize the theory's controversial standing in the expert community, its unscientific methodology, and the lack of facts or data supporting the theory.

You may also attack the theory by focusing on its inherent circular reasoning, as Dr. Sidney Dekker, a leading authority in the field, has demonstrated. Using Dekker's reasoning, the NTSB's "explanation" as to the cause of the Train 188 derailment boils down to the following:

> Why did the engineer fail to slow for the curve?
>
> Because he lost situational awareness.
>
> Why did he lose situational awareness?
>
> Because his attention was diverted.
>
> What happened when his attention was diverted?
>
> He lost situational awareness.
>
> How do you know he lost situational awareness?
>
> Because he failed to slow for the curve.[12]

Use case facts to debunk loss of SA. Even without challenging the theory's validity, you may be able to discredit it using facts obtained during litigation—especially facts the NTSB ignored or minimized—to show that the operator did not lose SA. The NTSB's probable cause determination in its Train 188 investigation is a good example.[13]

After ruling out other causes—mechanical malfunctions and operator impairment or fatigue—the NTSB speculated that the engineer experienced a loss of SA when he became distracted by a nearby disabled commuter train and lost track of where he was on the route.[14]

However, empirical evidence and the engineer's own testimony contradict this conclusion. Specifically, the engineer told investigators that he appreciated where he was on the track and recognized the varying speed restrictions before the curve where Train 188 derailed. The locomotive's data event recorder demonstrated that he had "routinely" adhered to all speed restrictions leading up to the curve. Regarding the disabled commuter train along the same route—a crucial factor in the NTSB's analysis—the engineer stated he was only "slightly" concerned about the other train.[15]

Thus, all of the engineer's actions leading up to the derailment curve displayed consciousness and awareness, not confusion or forgetfulness. And even if he had lost SA near the disabled commuter train, as the NTSB concluded, he had ample time—nearly five minutes—to regain SA before the derailment.

The NTSB's final conclusion was unsupported by and contrary to the known facts. After the NTSB hearing on Train 188, the NTSB chairman admitted that the loss of SA theory was "the best we could come up with."[16] In the face of contrary evidence, the board fell back on a theory it has come to depend on in recent years—and one that may allow carriers and companies to escape liability.

Plaintiffs must counter the loss of SA with well-investigated, well-planned, and well-proven theories of liability that develop from a true root cause analysis of why a transportation tragedy occurred. The analysis should persuade a jury that fundamental negligence or recklessness caused the crash or derailment, not the apathetic loss of SA.

You must understand this theory and how you can discredit it so you're prepared for the next transportation accident case the NTSB investigates.

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Notes

1. *Derailment of Amtrak Passenger Train 188, Philadelphia, Pa. May 12, 2015*, Nat'l Transp. Safety Bd. 44 (2016), www.ntsb.gov/investigations/AccidentReports/Reports/RAR1602.pdf.
2. *Derailment of Northeast Illinois Regional Commuter Railroad Train 519 in Chicago, Illinois October 12, 2003*, Nat'l Transp. Safety Bd. 17 n.20 (2005), www.ntsb.gov/investigations/AccidentReports/Reports/RAR0503.pdf; *see also* Mica R. Endsley, *Toward a Theory of Situation Awareness in Dynamic Systems*, 37(1) Hum. Factors: J. Hum. Factors & Ergonomics Soc'y 36 (1995).
3. Sidney Dekker & Erik Hollnagel, *Human Factors and Folk Models*, 6 Cognition, Tech. & Work 79–86 (2004).
4. *Id.*
5. The sudden emergency doctrine generally provides that a person confronted with a sudden and unforeseeable occurrence, because of the short time in which to react, should not be held to the same standard of care as someone confronted with a

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foreseeable occurrence, and may therefore be relieved of negligence liability. *See, e.g.*, *Lockhart v. List*, 665 A.2d 1176, 1180 (Pa. 1995).

6. Positive train control (PTC) is a technological fail-safe designed to prevent train-to-train collisions and overspeed derailments. The technology uses a communications-based system between a locomotive, wayside track signals, and centralized stations. In 2008, Congress mandated PTC implementation on most passenger rail lines by December 2015, but the deadline was recently extended to December 2018. As a result, large swaths of U.S. rail lines do not have PTC installed or implemented. *See* 49 U.S.C. §20157 (2012).
7. 49 U.S.C. §1154(b) (2016); *compare Chiron Corp. & PerSeptive Biosystems, Inc. v. Nat'l Transp. Safety Bd.*, 198 F.3d 935, 940 (D.C. Cir. 1999) (excluding entire NTSB final accident report), *with Starling v. Union Pac. R.R. Co.*, 203 F.R.D. 468, 485 (D. Kan. 2001) (admitting factual portions of final report, but excluding opinions or conclusions).
8. 49 C.F.R. §835.2 (2016); *Brokaw v. Boeing Co.*, 137 F. Supp. 3d 1082, 1093 (N.D. Ill. 2015).
9. 49 C.F.R. §835.5 (2016); *and see In re Air Crash Disaster at Sioux City, Iowa, on July 19, 1989*, 780 F. Supp. 1207, 1209 (N.D. Ill. 1991) ("The current regulations further prohibit investigators from testifying in court and instead limit NTSB testimony to deposition form.").
10. *See Mullan v. Quickie Aircraft Corp.*, 797 F.2d 845, 848 (10th Cir. 1986); *Curry v. Chevron, USA*, 779 F.2d 272, 274–75 (5th Cir. 1985).
11. *See, e.g., Credle v. Smith & Smith, Inc.*, 42 F. Supp. 3d 596, 599 (D.N.J. 2013); *see also Chiron Corp.*, 198 F.3d at 941; *Campbell v. Keystone Aerial Surveys, Inc.*, 138 F.3d 996, 1001 (5th Cir. 1998); *Thomas Brooks Chartered v. Burnett*, 920 F.2d 634, 639 (10th Cir. 1990); *Benna v. Reeder Flying Serv., Inc.*, 578 F.2d 269, 271–72 (9th Cir. 1978).
12. *See, e.g.*, Sidney W.A. Dekker, *The Danger of Losing Situational Awareness*, 17(2) Cognition, Tech. & Work 159–61 (2015); John M. Flach, *Situation Awareness: Proceed with Caution*, 37(1) Hum. Factors: J. Hum. Factors & Ergonomics Soc'y 149–57 (1995).
13. The NTSB has investigated other train derailments in which it determined the engineer's loss of SA to be the root cause. For example, when an engineer of a commuter train in Chicago derailed at a speed of 68 mph on a rail crossing with a restricted speed of 10 mph, the board found that he failed to comply with speed signals because he was "scrutinizing his paperwork" while operating the locomotive. *See Derailment of Northeast Illinois Regional Commuter Railroad Train 519*, *supra* note 2, at 16. Ultimately, however, the NTSB concluded that the probable cause of the derailment was the engineer's loss of SA. *Id.* at 23.
14. *Derailment of Amtrak Passenger Train 188*, *supra* note 1, at 9, 44.
15. *Brandon Bostian Interview No. 2*, Nat'l Transp. Safety Bd. 6, 16 (Nov. 10, 2015), tinyurl.com/h9btsnz.
16. Michael Sisak, *Amtrak Victims: Investigative Findings Hard to Believe*, Associated Press (May 18, 2016), tinyurl.com/j6mmftm.