

Documents Without Borders

Who Sets the Standard?

Dorianne Shaffer

The world is no stranger to tragedies. But acts of terror, natural disasters, and massive infrastructure failures occur with enough frequency that major events often dominate global news reports. For my inaugural “Documents without Borders” column, which examines the intersection of international and US domestic government documents, I want to look at how we work to prevent some of these tragedies through regulatory safety standards.

Technical standards are documents that outline specifications for a wide variety of products, often focusing on things like materials, processes, and safety. Standards are taken up by a number of governmental and nongovernmental organizations including the US Department of Energy,¹ American Petroleum Institute,² and the International Standards Organization (ISO).³ Standards are often set by industry but are frequently codified by governments when they relate to the safety. For example, the US has heavily regulated vehicles through National Highway Traffic Safety Administration’s Federal Motor Vehicle Safety Standards.⁴ These standards are put in place to prevent tragedies like vehicle crashes, building collapses, and nuclear meltdowns.

In the United States, standards are often set by voluntary consensus, meaning they are “adopted by voluntary consensus standards bodies through the use of a development process characterized by openness, balance, due process, consensus, and the right to appeals.”⁵ The US Office of Management and Budget requires that federal agencies use voluntary consensus standards over government-unique standards in the course of their regulatory duties.⁶ This allows industry possess a large say in the standardization of their own products, increasing standard conformity and likelihood for self-regulation.

There are hundreds of standard setting bodies across the world, and nation states all maintain the right to regulate industry within their borders and recognize standards that will provide for the safeguarding of consumers, the environment, national security, and personal safety. However, having a multitude of standards creates obstacles for trade, negatively impacting the ability of standards set at the state level to provide for desired safeguards. The World Trade Organization administered the Agreement on Technical Barriers to Trade recognizes the impacts of excessive local standards and directs signatories to use international standards whenever possible, increasing conformity, transparency, and consensus.⁷ Over 200 standards-setting bodies, like the American National Standards Institute (ANSI),

apply the code outlined in the agreement. ANSI and other organizations work to increase collaboration, consensus, and compliance within industry, and ensure compatibility of products and parts manufactured in across the world. Still, national organizations and states work to have their own standards elevated to international acceptance. ANSI boasts the frequent use of American National Standards as a basis for International Standards Organization and other international standards.⁸

While there are many international safety standards, most enforceable regulation is done at the domestic level, and standards often vary slightly from nation to nation even for the same product. This can become a murky area considering our dependence on global trade. Components for the same complex piece of equipment or infrastructure can be sourced from well over dozen different nations. When parts are made to be compatible with one country’s standards, they may not function properly with parts made to a different country’s specified standards.⁹ This can cause elevated safety concerns and contribute to the tragedies they were initially meant to prevent.

In May of 2021, a Mexico City train derailed after the collapse of an elevated overpass, killing over twenty people and injuring nearly eighty.¹⁰ The disaster horrified many across the world and became a watershed moment for politics in Mexico City. The train was relatively new, having been completed with much pomp and celebration in 2012. However, it was plagued by shutdowns and accidents stemming from rushed and shoddy construction pushed to be completed before city elections.

In large scale disasters like this, there are often a number of small mistakes that cumulatively lead to a massive failure. Engineers who investigated the accident point to poor technique and failure to follow international and national safety standards as primary causes. In one documented case, to save time wheels and trains made to meet European standards were used instead while the tracks were made with American standards.¹¹ This led to a constant shaking and vibration as the trains were too small for the tracks and suffered extensive extra wear. While the incompatible standards were only one of the flaws that contributed to the issue, they were a significant marker of the train’s flaws.

Questions about a failure to comply with safety standards landed Boeing at the center of a large scandal and multiple investigations after its 737 Max aircraft was involved in two fatal accidents—the Lion Air Flight 610 in 2018 and Ethiopian Airlines Flight 302 in 2019.¹² The plane was subsequently grounded in many nations, including the United States.

Passenger aircraft like the 737 MAX operate in many nations, cross international boundaries, and are heavily regulated by multiple organizations and government agencies. When they crash, the casualties include victims from across the world—victims in the Ethiopian Airlines crash were from thirty-five different nations.¹³ In these cases, it is near impossible to examine the implications in one nation alone.

The primary cause of both 737 Max crashes involved faulty flight control software that caused the aircraft to nose-dive shortly after taking off, but investigations into Boeing have found more extensive problems. A Summary of the FAA's Review of the Boeing 737 MAX released in November of 2020 outlined intensive international collaborative investigations, shared numerous safety issues with the aircraft, and plans for a return to service.¹⁴ The report's executive summary explicitly states, "The FAA's intent is to assure the global community that the 737 MAX is safe to operate and meets FAA certification standards." The need for this appeal stems from the fact that much international aviation standards are not enforceable—including Standards and Recommended Practices from the International Civil Aviation Organization (ICAO), a United Nations specialized agency.¹⁵

In the end, most international oversight bows to state sovereignty. While organizations like the ICAO can do great work to foster collaboration and agreement on aviation standards that impact many nations, their recommendations are just that, and must be taken up legally by individual states and their civil aviation authorities.¹⁶ In the event that these standards are not followed, the ICAO may assist member states in setting up condemnations, investigations, and new agreements, but that is the extent of their enforcement ability. While this approach protects sovereignty that most states would never give up, it leaves international agencies with little redress, even during emergencies. In the case of the Boeing 737 MAX, the aircraft was grounded by individual states who led both independent and collaborative investigations like the Joint Authorities Technical Review headed by the FAA.¹⁷

It is vital that officials, industry leaders, and engineers understand what technical safety standards are legally mandated, which ones are needed for industry certification and recognition, which are recommended by international agencies, and most importantly—how they differ. Even engineers working on purely civil infrastructure projects like the Mexico City train must be aware of these intricate and sometimes small differences. This can be challenging in the face of political or corporate pressure to complete projects faster and under budget. No matter the pressure, international documents that specify

technical safety standards must be consulted in order to prevent catastrophes like those outlined in the column. "Who sets the standards?" is a question that cannot be left unanswered.

Dory Shaffer (dmshaffe@mtu.edu), Research,
Education & Outreach Librarian, Michigan Technological
University

Notes

1. Department of Energy, "DOE Technical Standards Program," <https://www.standards.doe.gov>.
2. American Petroleum Institute, "API Occupational Safety and Health Standards," <https://www.api.org/oil-and-natural-gas/health-and-safety/worker-and-worksitesafety-resources/api-osh-standards>.
3. International Standards Organization, "Consumers and Standards: Partnerships for a Better World," <https://www.iso.org/sites/ConsumersStandards/index.html>.
4. National Highway Traffic Safety Administration, "Regulations," <https://www.nhtsa.gov/laws-regulations/fmvss>.
5. American National Standards Institute, "American National Standards ANS Introduction," <https://ansi.org/american-national-standards/ans-introduction/overview>.
6. Office of Budget Management, "OMB Circular A-119," January 2016, <https://www.nist.gov/document/revised-circulara-119asof01-22-2016pdf>.
7. World Trade Organization, "Agreement on Technical Barriers to Trade," 1994, https://www.wto.org/english/docs_e/legal_e/17-tbt_e.htm.
8. American National Standards Institute, "American National Standards ANS Introduction."
9. International Standards Organization, "Consumers and Standards: Partnerships for a Better World," <https://www.iso.org/sites/ConsumersStandards/index.html>.
10. Mark Stevenson, "Mexico City Subway Collapse Was a Tragedy Foretold," AP News, May 5, 2021, <https://apnews.com/article/mexico-mexico-city-health-coronavirus-pandemic-ee916392ef4f4feb3434bfd95a0e70>.
11. Natalie Kitroeff et al., "Why the Mexico City Metro Collapsed," *New York Times*, June 13, 2021.
12. Department of Justice, "Boeing Charged with 737 Max Fraud Conspiracy and Agrees to Pay over \$2.5 Billion," January 7, 2021, <https://www.justice.gov/opa/pr/boeing-charged-737-max-fraud-conspiracy-and-agrees-pay-over-25-billion>.

13. BBC News, "Ethiopian Airlines: The Victims of 'a Global Tragedy,'" April 4, 2019, sec. Africa, <https://www.bbc.com/news/world-africa-47522028>.
14. Federal Aviation Administration, "Summary of the FAA's Review of the Boeing 737 MAX," November 18, 2020, https://www.faa.gov/foia/electronic_reading_room/boeing_reading_room/media/737_RTS_Summary.pdf.
15. International Civil Aviation Organization, "About ICAO," <https://www.icao.int/about-icao/Pages/default.aspx>.
16. Federal Aviation Administration, "Summary of the FAA's Review of the Boeing 737 MAX."
17. International Civil Aviation Organization, "About ICAO."