LESSONS LEARNED TO CHART THE FUTURE: BUILDING ACROSS BORDERS

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I. INTRODUCTION:

Europe's long tradition of building — with structures standing for centuries, often millennia — reflects a regulatory framework that is often more performance-based than the prescriptive codes that dominate in the United States. This paper and accompanying presentation explore how differences in regulations, product standards, and liability frameworks shape construction practices on both sides of the Atlantic, and what attorneys, their construction and manufacturing clients and their insurers can learn from Europe's approach to safety and compliance. From lessons embedded in centuries-old structures to modern questions of whether products designed for one system can function in another, our panel will chart how past practices and regulatory philosophies can inform the future of risk management across borders. The panel will also examine the current issues facing the construction industry as it grapples with the uncertainty caused by disruptions to critical inputs.

II. HOW CONSTRUCTION STANDARDS HAVE EVOLVED IN THE UNITED STATES AND EUROPE

A. Building Codes in Europe

As noted in an article describing the changes to the Mitchell Building on the Stanford University campus, building codes have existed in varying forms for centuries. "As early as 1750 B.C., the Babylonian Empire's Code of Hammurabi read, 'If a builder has a built a house for a man and his work is not strong, and if the house he has built falls in and kills the householder, that builder shall be slain.'" See, Stanford University and the 1906 Earthquake, at https://quake06.stanford.edu/10-evolution-codes. Building "codes" have been around for almost as long as individuals have organized themselves into cohesive governmental entities. For that entire time, individuals, governments and the individuals that have struggled with the scope of building codes and all of the associated issues that arise as a result.

Similar to the United States, discussed below, European building codes initially evolved in response to significant and catastrophic events. See, Vienna Building Code of 1829; Prague's building rules (1815) and London's multiple acts after several large fires. See, Rebuilding of London Act 1667 after the "Great Fire." Naturally, Nordic countries developed rules and codes that emphasized cold weather durability and southern Europe added earthquake provisions. Our FDCC Annual Meeting host country, Portugal, introduced the "gaiola pombalina" (Pombaline cage), which mandated the use of flexible timber-frame structures embedded within masonry to withstand ground deformation. This adoption did not occur in a vacuum, but rather was in response to the earthquake of 1755 that caused significant damage. See, Timber frames as an earthquake resisting system in Portugal, E. Poletti, G. Vasconcelos & P.B. Lourenço, Department of Civil Engineering, University of Minho, Guimarães, Portugal (2015).

The first generation European Standards (EN) applicable across the Union were published between 2002 and 2007 and consisted of ten main parts, covering design, actions/loads, concrete, steel, timber, masonry, geotechnical, seismic, aluminum and composite structures. As of 2010 the EN were mandatory for all EU public works and the default standard for private sector projects. The second generation of these standards are rolling out between 2026 and 2028.

Also evolving during recent years is the treatment of energy efficiency and sustainability. While starting in the 1970's during the energy crisis, the Energy Performance of Buildings Directive (EPBD) was initiated, which was later repurposed in 2010 to "nearly zero-energy buildings" (NZEB) for new buildings. This was designed with a goal of decarbonized building stock by 2050.

B. Evolution of Building Codes In The United States

The evolution of the construction standards started to develop primarily in response to various incidents that forced lawmakers to respond to outcry due to property damage and loss of life. The Great Chicago fire of 1871 and the Baltimore fire of 1904 prompted the development of fire resistant requirements in new buildings (which ultimately led to the drastically increased use of asbestos in buildings that did not significantly abate until the 1980's)[1]. The National Boad of Fire Underwriters published early model recommendations in or around 1905. In 1921, the U.S. Department of Commerce formed the Building Code Committee to research and improve standards aiming to reduce costs and boost housing output. This funded studies on fire safety, plumbing, lumber properties and framing. By 1927, the International Conference of Building Officials (ICBO) published the first model building code by code officials (Uniform Building Code). However, even within the United States, regional differences remained. The Northeast/Midwestern states primarily used the BOCA model; in 1945 the SBCCI was published, used primarily in the South/Southeast and the ICBO was used primarily in the West. This inevitably created inconsistency for builders working across different parts of the United States.

The middle of the 20th century did bring in some uniformity related to requirements for materials to withstand strong winds and energy efficiency requirement emerged out of the energy crisis of the 1970's. It was not until the late 1990's when the three regional organizations (BOCA SBCCI, ICBO) merged to form the International Code Council (ICC), aiming to eliminate the chaotic patchwork of codes. The late 1990's and early 2000's saw the appearance of the International Building Code (IBC) in 2000 and the International Residential Code (IRC). Since the appearance of the IBC and IRC, there have been triennial update cycles focusing on research and data from significant events, such as the flood and wind provisions being impacted by Hurricane Katrina in 2005. Resiliency, energy efficiency and overall hazard mitigation have been the focus of many of these code update over the past twenty years.

The building standards have become much more uniform across the United States, but because of the federal system of government, local variations are still prevalent depending on the needs of the locality. An example would be California's focus on stricter seismic rules and Florida's hurricane path and the importance of addressing problems caused by high winds.

[1] It is generally understood that asbestos was first being used in Europe upwards of 4,500 years ago with later uses by the Romans and Greeks

III. A STUDY IN DIFFERENCES BETWEEN THE UNITED STATES AND EUROPE - HOW WE LIFT THINGS

Construction equipment safety standards in Europe and the United States share a common objective—reducing the probability and severity of harm—but they are built on fundamentally different regulatory philosophies. These differences influence equipment design, conformity assessment, operational practices, and liability allocation. For organizations operating cranes, rigging systems, and specialized transportation across borders, understanding these structural distinctions is essential for effective risk governance.

The European system is rooted in the EU Machinery Directive and the CE marking framework. It emphasizes premarket risk reduction, requiring manufacturers to integrate safety into equipment design through formal risk assessments, engineering controls, and documented conformity. Harmonized EN standards operationalize ISO principles and establish uniform design expectations across the European market.

The United States system, governed by OSHA and supported by ANSI/ASME consensus standards, places primary responsibility on Lift Directors and then to a less extent employers and operators. Compliance is performance-based, and risk is managed operationally through training, inspection, supervision, and procedural discipline. Manufacturers self-certify equipment, and enforcement occurs primarily at the jobsite.

This presentation harmonizes the content of two source documents into a single, coherent, non-redundant analysis. It uses ISO 12100 and ISO 31000 as a neutral framework to compare regulatory structures, risk treatment philosophies, and operational implications for crane, rigging, and specialized transportation activities.

These differences are reflected in how construction equipment is handled and addressed. European regulations require:

- Equipment to be delivered with comprehensive instructions
- Employers to ensure operator competence
- National or third-party inspection regimes depending on jurisdiction
- Limited tolerance for field modification due to conformity implications

Operational safety is built on the assumption that design has already eliminated or mitigated hazards. The United States Operational requirements through OSHA mandate:

- Crane operator certification through accredited bodies such as NCCCO
- History of NCCCO
- Defined roles such as site supervisor, lift director, lift owner, lift operator, lift user, signalperson, and qualified rigger
- Daily, monthly, and annual inspections
- Lift planning for critical operations
- Documentation of operator qualifications and inspection records

Operational safety is built on the assumption that risk must be actively managed in the field. The chart below provides an overview of the how "risk" is treated on either side of the Atlantic Ocean:

Table — Comparative Overview of Risk Treatment

ISO Risk Concept	**European Application**	**American Application**
Risk assessment	Formal assessment prior to market placement	Operational hazard analysis
Risk reduction	Design-based priority	Operational risk management
Protective measures	Engineering controls emphasized	Administrative controls emphasized
Residual risk	Documented and communicated	Accepted and managed
Foreseeable misuse	Explicitly addressed	Implicitly managed
Primary responsibility	Manufacturer	Employer / operator

As related crane rigging, these differences result in some profound differences. For multinational organizations that work across jurisdictions, they must account for:

- Certification compatibility when deploying equipment internationally
- Differences in operator qualification requirements
- Variations in inspection and documentation expectations
- Liability exposure based on manufacturer vs. employer responsibility
- Regulatory enforcement differences affecting project risk profiles
- Cultural differences in risk treatment (design-centric vs. operational)

Failure to align equipment and operational practices with regional requirements can result in:

- Regulatory penalties
- Project delays
- Increased liability
- Misalignment between equipment capabilities and operational expectations.

A coordinated compliance strategy is essential for crane, rigging, and specialized transportation operations.

IV. MODERN RISK ASSESSMENT CONSIDERATIONS - PROCUREMENT VS. STRATEGIC RISK

One hundred years ago, governments worked to respond to natural disasters and other catastrophic events through examination of the methods and means of commercial and residential construction. This resulted in increasingly uniform rules and guidelines that reduced the potential harm, resulting in mitigation of risk for builders and manufacturers of the products that are used in construction. The emergence of the global supply chain in the latter half of the 20^{th} century, accompanied by reduced risk in navigation of the seas, created an environment where reasonable certainty was the norm and not the exception. This afforded the ability to reduce risk domestically in relation to construction materials and methods, however, it failed to address broader strategic implications that were created by reliance on materials that were far from the ultimate location where construction was to occur. In the past several years starting with the COVID pandemic, followed by the Russia-Ukraine war, there has been a devolution of certainty that builders and manufacturers previously maintained. In fact, the level of uncertainty for construction industry members operating in both North America and Europe has likely not been higher in the last 80 years than it is today. Global supply chains, underpinned for several decades, through a "just in time" theory of delivery are fraying.[2] Inflationary pressures combined with tariffs and geopolitical tensions across Europe, and more recently, the Middle East, currently place construction affiliated companies in a precarious situation related to access to raw materials, or at least the inputs needed for raw materials. None of the Code advancements implemented in the 20th century addressed or even contemplated these issues. We are truly entering new and unchartered territory for the construction industry with the current geopolitical environment. Where before the focus was on the quality of the construction, the focus has immediately been shifted to whether the construction can occur at all and under what terms.

Construction industry members are currently facing uncertainty when planning long-term projects due to global supply chains experiencing disruption and inflationary pressures driving up the cost of raw materials. Tariffs, rising oil prices and disruption of shipping routes in response to geopolitical tensions in the Middle East, among other concerns, have made it difficult for builders and developers to predict the cost and availability of key materials. A brief sampling of the issues at the time of this paper starts with the reality that the Strait of Hormuz is closed, constituting approximately 20% of global seaborne oil, as well as liquid natural gas. These critical components have now effectively been placed off-line. The impact on companies involved in the construction industry are significant. The Gulf states, including Saudi Arabia and the United Arab Emirates produce approximately 9% of the global primary aluminum outside China. Aluminum scarcity impacts windows, cladding, roofing, structural components and facades. Steel, including coils and rebar, are impacted through higher energy costs creating higher production costs for blast furnaces and electric arc furnaces. See, Linesight, "How the Middle East Conflict Is Affecting Global Construction Material Costs," McNamara, Derek, March 9, 2026. Steel shipments through the Strait have been reduced by approximately 93% according to some estimates. Iran has also now levied a significant surcharge to the limited ships permitted to pass through the Strait.

PVC piping, plastics, polymers, insulations, paints, adhesives and sealants are also significantly impacted. Ethylene, propylene, methanol, naphtha are all key elements for PVC, polypropylene, polyethylene and construction related chemicals. There are some reports that from approximately one month of the Hormuz closure, PVC pipes have risen in price approximately 36%.

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[2] As of the date of the submission of this paper for use at the FDCC Annual Meeting, the Strait of Hormuz has been blocked by Iran, imperiling significant raw inputs that are essential to the construction industry, not only in the United States and Europe, but also Asia. This has led to a recent spike in inflation due to geopolitical tensions and the uncertainty around the availability of petroleum and related derivatives from throughout the Middle East. Equally as important are the scattered attacks on shipping routes which has created tremendous issues with securing maritime insurance for shipments.

As these uncertainties continue to affect global supply chains, provisions such as force majeure clauses and material adverse change clauses are expected to move to the forefront of construction contract negotiations. Indeed they already are. QatarEnergy declared force majeure on LNG contracts in early 2026. The Iraq Oil Ministry has undertaken similar steps.

Large construction projects often require contractors and sub-contractors to source materials in advance to meet project schedules. During that time, market conditions can change dramatically. Fuel price increases can drive up the cost of transporting materials, and inflation may raise the price of steel and concrete. Disruptions to shipping routes and natural disasters may delay deliveries. These unexpected developments can place significant financial pressure on projects that were originally negotiated under the assumption of fixed pricing. This very situation is happening at time of the publication this article.

Where only several years ago, the focus for construction projects was on the regulatory framework in place as between the EU and United States, the immediate prospect is the contractual terms of the agreement to construct a particular building or in relation to a piece of equipment. Inputs, long regarded as secure, have now shifted into the role of the most problematic and uncertain aspect of a construction contract.