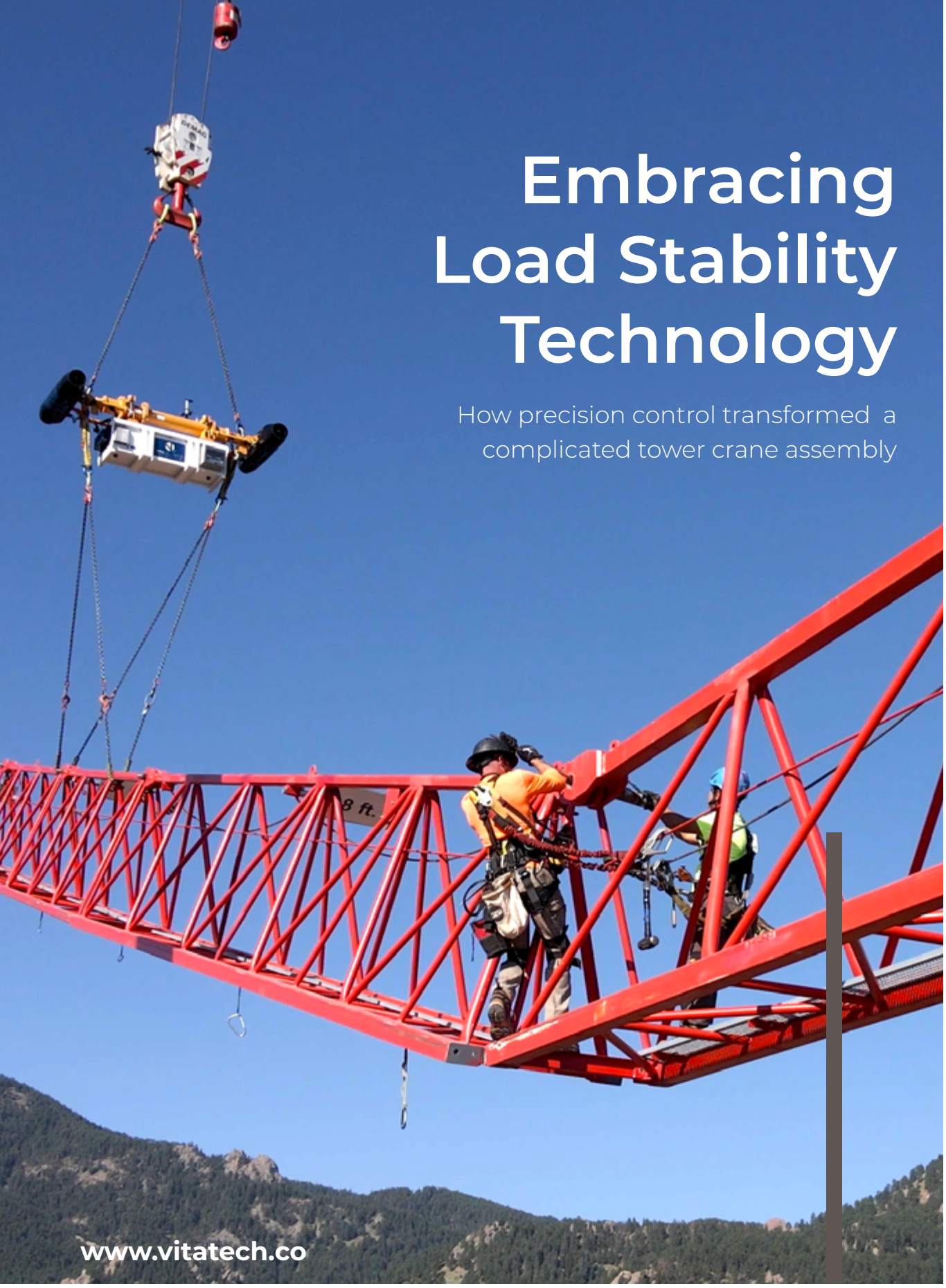
Embracing Load Stability Technology

How precision control transformed a complicated tower crane assembly



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Case Study 2022

Lifting technicians receiving the jib arm of a tower crane utilizing the Vita Load Navigator.
July 11th, 2022 Boulder CO

VITA INDUSTRIAL

The Vita Load Navigator uses high powered thrusters to eliminate load movement during crane lifts, enabling riggers to remotely stabilize loads and precisely place them via manual controls that can rotate even the heaviest lifts in controlled increments. The ability to pass control from the ground crew remote to a second remote utilized by the technicians up on the structure ensures a smooth assembly process.

Vita Industrial

How Load Stability and Precision Control Transformed a Tower Cranes Assembly

The size and complexity of the component parts of a tower crane can be a challenge for erection crews to manage. a also can be especially challenging when cranes go up on narrow sites that are close to pedestrians, roads, and buildings. There are also potentially hazardous process involving working at heights, awkward postures, lifting and aligning components of significant size and mass and installing temporary support systems. Crane assemblies are often performed under significant time pressure due to the need for road closures, suitable daylight hours or short weather windows. To help mitigate these issues Vita Industrial recently worked with Creative Lifting Services to test out the Vita Load Navigator on a tower crane assembly in Boulder Colorado.

The result: a much safer job site and an erection that stayed on schedule.

Load stability is especially critical when attaching jib arms to the tower structure.

Vita Load Navigator Specs:

40mt	Lifting Capacity	**30 mph**	Wind Rating (Nominal)	**12**	Hours per charge	**Remote**	Operation & Control

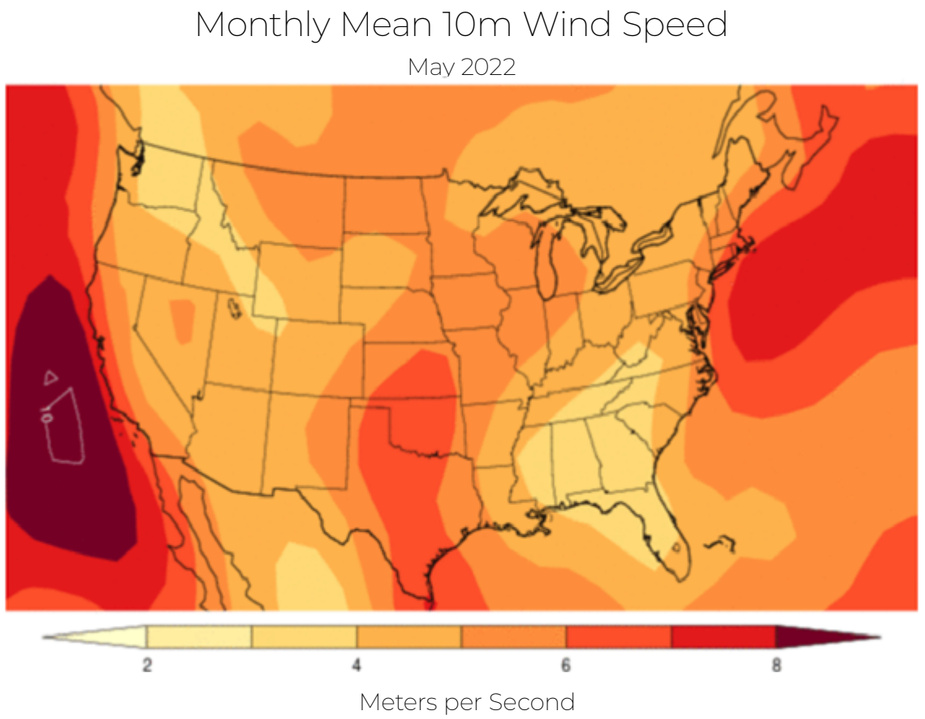
Navigating Challenging Wind & Weather

Wind & Weather can cause significant safety issues when assembling tower cranes.

Wind can be a significant safety issue when lifting the various components of the Jib assembly. Not only are the components often prone to kiting factors but having workers receiving the jib assembly parts means further exposure and risk when adverse weather and wind does arise. A compounding problem known as the “wind channeling effect” can also pose serious risk when assembling a tower crane in cities with large buildings in proximity. The issue occurs when wind gusts hits buildings and, with nowhere else to go, are pushed up, down and around the sides, often dramatically increasing wind speeds in what are known as micro-burst events.

April 2022 Monthly Average Wind Speeds

A study published in the journal Nature Climate Change finds that winds across much of North America, Europe and Asia have been growing faster since 2010



Micro-burst events have been documented to push over trucks and more generally wreak havoc on job sites. In some areas the problem has gotten bad enough that city governments are now mandating complex wind studies before they will approve new skyscraper construction.

Erecting in Narrow, Awkward & Busy Sites

Navigating Obstacles

When windows are tight, both on the ground and in the air, getting the larger pieces of the crane assembly into place can be time consuming. Multiple tag line operators must navigate busy and loud construction sites while trying to communicate amid the roar of heavy machinery. Taglines can also easily exceed 200’ and are not only incredibly difficult to manage but also can be a major safety risk.

Staging Crane Assembly Parts

When working a busy urban site, it is also common to have to stage the tower crane assembly parts on an adjacent road or far from the base of the tower crane. Swinging large components across the construction site compounds risk.

Time Pressure

As construction projects continue to get larger and more complex, and as deadlines get tighter, crane operators are feeling the pressure. A project can only go as fast as a crane can lift and pushing crane operators to work faster can have extremely negative impacts on safety – something that is never a good idea.

Vita’s Load Navigator allows crews to better navigate small, busy worksites by replacing tag lines with a pinpoint accurate remote.

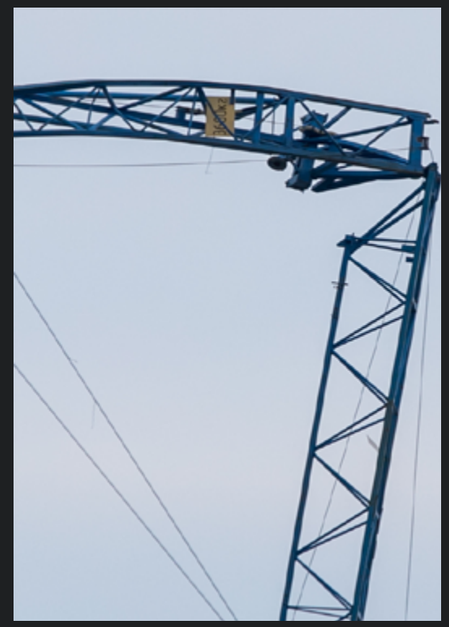
Understanding Risk

The costly mistake operators are making:

“We have never had an accident before”

There is a simple truth that is common to all people. The more you do something without suffering a bad outcome, the harder it becomes to remain aware of the risks associated with that activity. Have you ever texted & driven? If you did not suffer an accident when you did then odds are you more likely to do it again. We might trick ourselves into thinking we are safe while we do it, but we are not. The odds of getting into an accident while texting and driving remain the same every time you do it.

The same is true on the construction site. Risk factors on the site remain the same no matter how many times you avoid getting hurt or causing an accident. If you take the same risk 100 times, your odds of getting hurt the 101st time are the same as the odds of getting hurt the first time you do it.



Real World Accidents

Two employees were killed when a crane that they were disassembling collapsed and struck a commercial building. Two people in their vehicles in the immediate area were killed too.

In another documented incident a tower crane jib collapsed while the jib was being dismantled. Three workers were on the jib and suffered various injuries. Parts from the jib landed on an adjacent building. The building and the street on either side of the building were closed for the recovery operation.

In yet another recent accident five workers were working on the erection of a crane tower when one of them became pinned between the climbing unit and the frame of the tower crane. He died of his injuries.

Case Study

Tower Crane Build Using the Vita Load Navigator

Boulder, CO

Using Load Stabilization Technology

While setting up a tower crane may not be overly complicated, the size and complexity of their components can be a challenge for erection crews to manage. Creative Lifting Services (CLS) recently partnered with Vita Inclinata (Vita) to test out Vita's flagship load stabilization product, the Vita Load Navigator, on a tower crane assembly located on a bustling corner in downtown Boulder, CO. The system not only enabled CLS to dispense with taglines, but also completely removed rigging personnel from the load path – ensuring the crew's safety and the job's viability.

Assembling the T-Section

The Vita Load Navigator uses high powered thrusters to eliminate load movement during crane lifts, enabling riggers to remotely stabilize loads and precisely place them via manual controls that can rotate even the heaviest lifts in controlled increments. The ability to pass control from the ground crew remote to a second remote utilized by the technicians up on the structure ensures a smooth assembly process.

"The guys at the top of the crane were happy with the process - instead of co-ordinating with two tagline operators on the ground, the crane tech up top was able to guide it in via a remote. Communication can be a major issue on construction sites – heavy machinery can make a lot of noise – the remote really solved that issue."

Josiah Rausch, Crane Tech Manager for CLS

VITA INDUSTRIAL

Placing the Jib

The process of hoisting and attaching the jib and counter jib was a major potential issue on this build. The team closed off the street adjacent to the site and had to carefully maneuver it from the truck, across the site and up onto the tower. Because of the length and positioning of the jib there was a major risk of impacting the boom of the lifting crane. Traditionally the crew would have utilized multiple ground operators and long difficult to manage taglines to maneuver the jib into place. Because of the risk, CLS opted to attach tag lines "just in case" the Vita Load Navigator ran into any issues. From the moment the unit engaged however it flawlessly stabilized and navigated the jib precisely into place. The tag lines were never utilized.

"Crane operators should always seek to have a clear and unbiased evaluation of risk that does not rely on simply saying "well we haven't had an issue as of yet."

Josiah Rausch, Crane Tech Manager for CLS

Case Study

Placing the Counter Weights

It is essential to be cautious when working with and installing counterweights. Workers who find themselves between the two points might be pinched and seriously wounded, if not killed. When placing the counterweights, the technicians up on the crane were able to precisely guide in each weight via the remote pendant, removing yet one more potentially dangerous layer of having to manually position the heavy and dangerous weights.

Crane Technician using the Vita Load Navigator pendant to guide the counter weights into place.

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