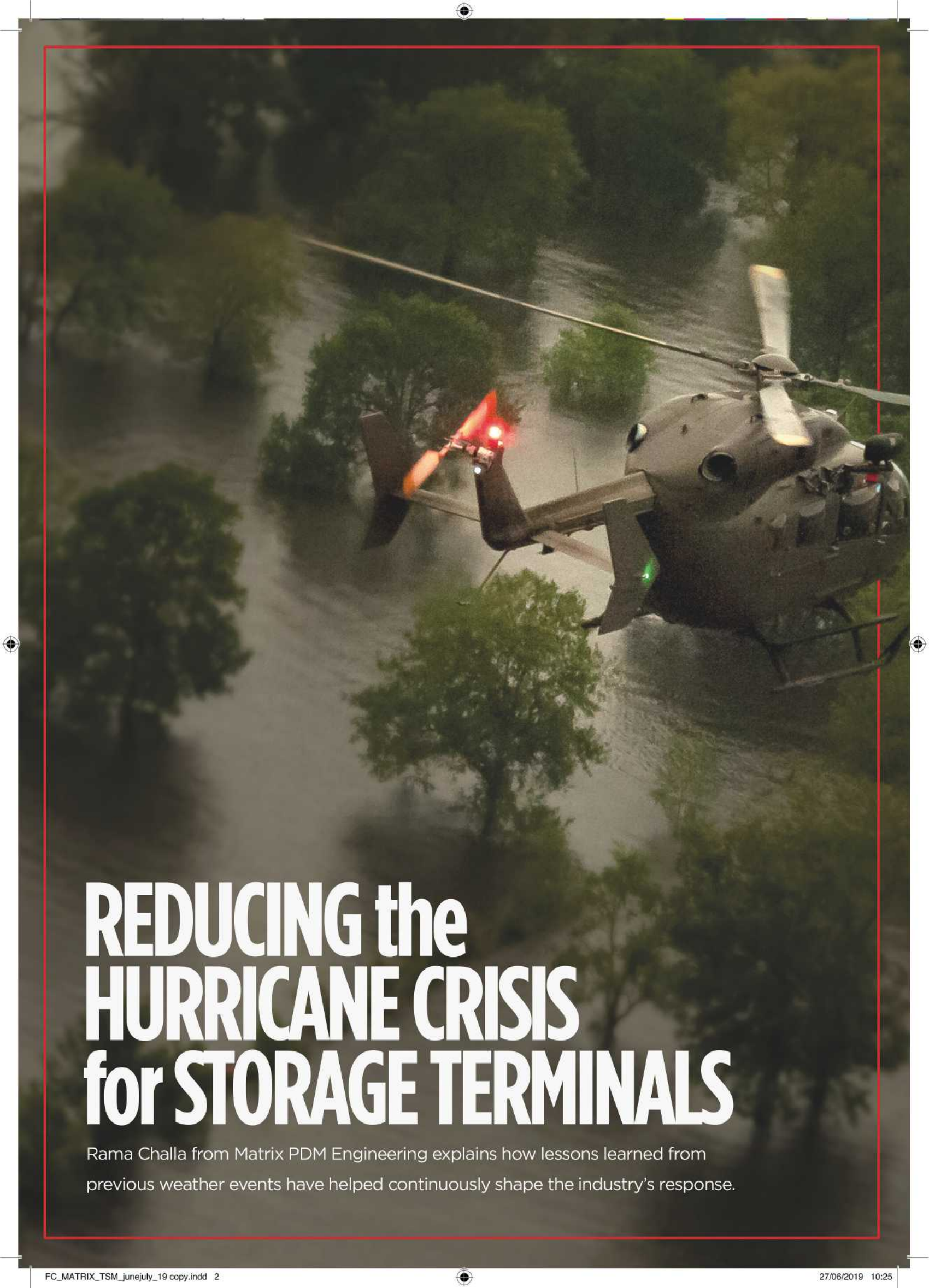


A military helicopter, possibly a Black Hawk, is shown in flight over a dense forest at night. The helicopter's main rotor and tail rotor are visible, and its landing lights are illuminated. The scene is dark, with the forest below appearing as a silhouette against the night sky.

REDUCING the HURRICANE CRISIS for STORAGE TERMINALS

Rama Challa from Matrix PDM Engineering explains how lessons learned from previous weather events have helped continuously shape the industry's response.

REDUCING THE HURRICANE CRISIS FOR STORAGE TERMINALS

As the number and severity of hurricanes has increased in the US in recent years, Rama Challa from Matrix PDM Engineering explains how lessons learned from previous weather events have helped continuously shape the industry's response

A new study¹ has revealed that hurricanes intensify more quickly now than they did 30 years ago. Recent hurricanes such as Harvey, Irma and Jose are recent examples of this growing trend and highlight the devastating consequences they can have on the environment, society and the economy.

In addition to affecting storage tanks, hurricanes can impact storage terminal assets by causing damage to floating roofs, flooding the facilities, affecting other operating infrastructure, and cause power failures.

In an interview with *Tank Storage Magazine* Rama Challa, director of AST and specialty vessels at Matrix PDM Engineering, says that as the amount and severity of hurricanes has increased, many storage operators have improved their related response plans.

'Most operators have identified hurricanes as potential crises for which they need to plan. Access to better weather data and lessons learned from previous events have also helped improve preparedness and response.'

Key learning points from previous hurricanes include:

- The need for comprehensive pre-hurricane preparedness and post disaster recovery plans;
- Understanding the criticality of any potential impact of rainfall intensity and duration and its effect on equipment and infrastructure;
- Recognition of the personal impact a hurricane may have on terminal employees, and;
- Awareness that, because of the impact the hurricane may have on the greater community, availability of labour and resources can be constrained.

Challa adds: 'As with any crisis, communication with all stakeholders, including employees, contractors, customers, and the community at large, is key.'

PLANNING IS KEY

Proper planning, inclusive of robust assessments and pre-identified activities prior to, during and post hurricane event can mitigate the destructive effects on a facility.

First and foremost, terminal owners/operators should plan for the protection of terminal employees, contractors and other who may be on site during or after an event, according to Challa.

Challa says: 'As to the assets, terminal owners/operators should take a formal approach towards classification of assets and identification of vulnerabilities. This requires evaluating each individual asset and related components and assessment of the potential for failure.'

Examples of this include:

- An external pontoon floating roof is critical and assigned a risk category A. Once classified as such, the asset should be examined and assessed for vulnerability, such as having inadequate roof drains. Once this vulnerability is identified it can be addressed and the risk mitigated. Adding a geodesic dome, for example, can provide some additional mitigation against a floating roof sinking in the event of excessive rainfall accumulation on the roof.
- An internal floating roof is not as risk-prone and therefore has less vulnerability.
- A control valve has a higher risk and is vulnerable due to the need for continued operation and uninterrupted power. Mitigation in the form of an alternate power source may need to be considered.

Matrix PDM Engineering is working with the industry to further improve hurricane planning and preparedness.

'We work with our customers to develop hurricane preparedness plans including assessment and classification of assets such as aboveground storage tanks, assessment of roof drain capabilities, review of terminal infrastructure, and development of defined mitigation measures to minimize the impact such as recommending safe fill levels and engineering UPS systems.

'We also provide support to our clients in post-event repair and reconstruction across multiple construction disciplines and we support major utility and industrial clients by providing crews to restore power and energy to affected facilities.'

Challa will be speaking more about hurricane preparedness and response in the security and emergency response track of the conference

“Most operators have identified hurricanes as potential crises for which they need to plan”