Remote rescue

Wind power has been growing at an unprecedented rate and is becoming more widely used worldwide. According to the UK Wind Energy Database, there are 4,560 onshore turbines and 1,075 offshore turbines in the UK.[1]

A wind turbine has a typical design life of 20 to 25 years. The turbine comprises a tower that supports a rotor assembly (blades and hub) and nacelle (containing the generator component), which typically stands at a height of 60 to 80 metres. Wind turbine operators need to carry out regular and planned maintenance visits to complete essential maintenance work, including the repair and replacement of components.

Maintenance workers who undertake service checks and carry out preventative work operate at considerable height. The preventative side of their work is essential because it enables wind farm operators to highlight and rectify any operating problems, which in turn helps to extend the turbine's life and that of its components. In carrying out this type of work, wind farm operators can hopefully reduce down time, maximise production and maintain a return on investment. What's more, many wind turbine manufacturers require an annual service to keep the warranty valid.

For anyone working on a wind turbine generator, there are a host of potential hazards that would require first aid provision should an incident take place. To complicate matters further, if someone is injured, there is a strong likelihood that it would be in a difficult-to-access location, or in a restricted working position such as work at height or in confined spaces.

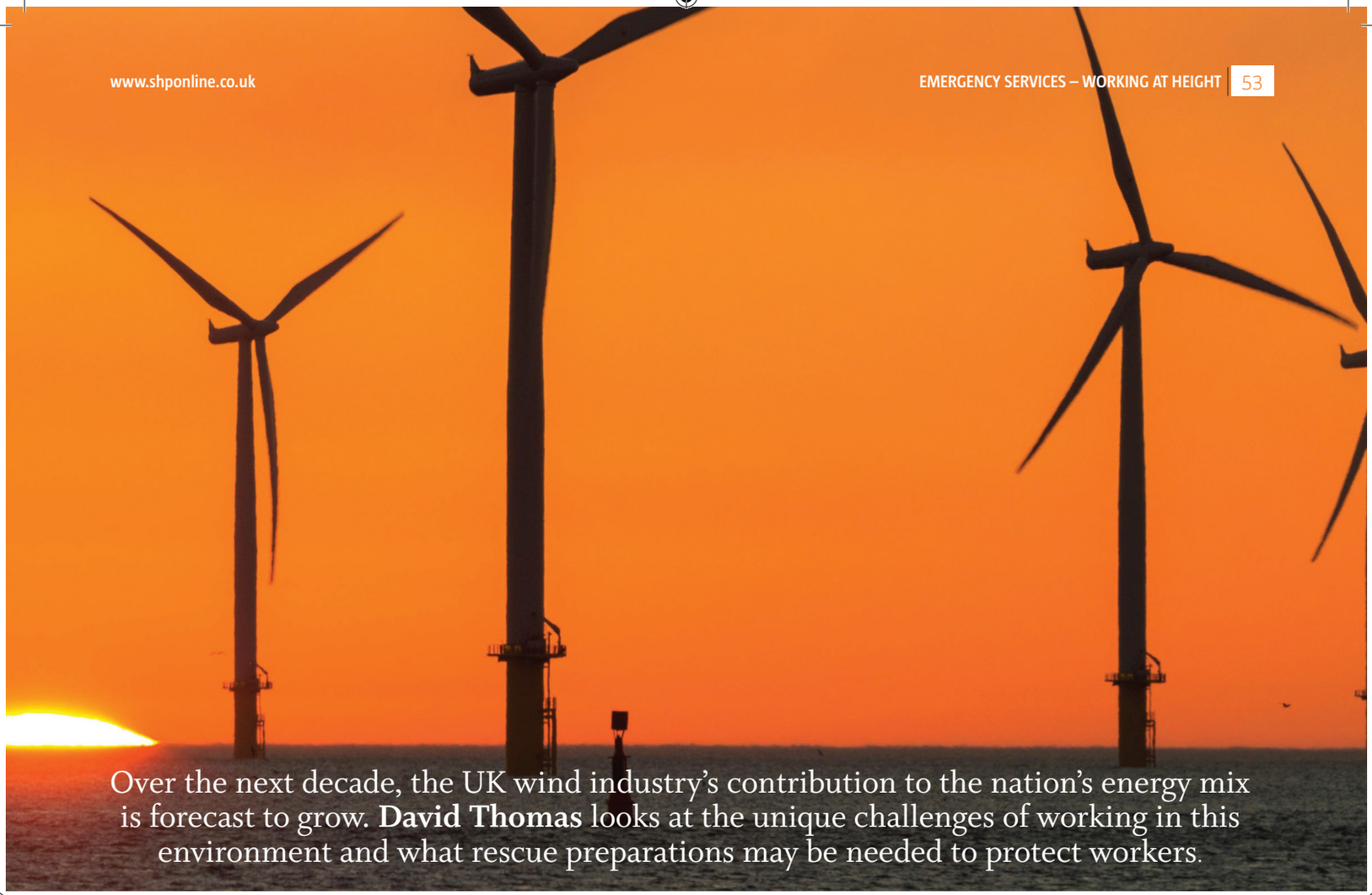
Quite often, wind turbine farms are sited in remote locations and, should an accident happen, this remoteness could mean a delay in the arrival of emergency services. What's more, access to site roads may be restricted or difficult to navigate. Once on-site, emergency services could be faced with injuries that are both complex and difficult to treat, for example, suspension syncope, electric shock, major trauma, crushing, entrapment, etc. It's also worth noting that paramedics called to a site may not have the necessary training to treat the injured party in the turbine's structure.

When it comes to work in 'confined spaces' there are several areas in a wind turbine's structure, which this could relate to, such as the tower, nacelle or hub. Whether a confined space is realised will depend upon the substances present, the work that needs to be carried out and the level of ventilation. Potential confined spaces should be identified at the design stage, and also through the operation of safe systems of work. The risks relating to proposed work in a confined space must be assessed, and appropriate precautions implemented if such work cannot be avoided.

Due to the unique nature of this work environment, suitable arrangements[2,3,4] need to be in place for the initial response, including the care and evacuation of any casualties, and liaison with external emergency services.

Emergency response should follow the pre-determined procedures detailed within the site's emergency response plan (ERP). When developing one, consideration must be given to the remoteness of the site location, response times and the equipment and training provided. Taking these measures not only promotes self-sufficiency but also helps to preserve life until emergency services arrive on site.

In most cases, wind farms should have the necessary capabilities to respond to foreseeable situations, whether that is from



Over the next decade, the UK wind industry's contribution to the nation's energy mix is forecast to grow. **David Thomas** looks at the unique challenges of working in this environment and what rescue preparations may be needed to protect workers.

the owner and/or operator, contractor(s) or other employer(s).

Every type of turbine, indeed perhaps every individual turbine, is different. Therefore, it's vital that an ERP is practised and reviewed periodically. Any risk assessment also needs to take into account the prevailing weather conditions, the nature of any work being undertaken, the handling of loads, radio-frequency isolation, electrical issues, communications, safe access and egress, tools and equipment and the level of worker competence.

When it comes to planning for potential rescues, RenewableUK provides health and safety guidance for the wind energy sector.[5] The benchmark for work at height training and rescue is contained in an approved training standard.[6] Developed in consultation with the leading industry representatives, the aim of this standard is to ensure that all personnel are able to demonstrate a common level of basic competency.

The two-day course includes both basic and specific rescue principles and techniques, including techniques for the recovery of a casualty from a vertical ladder, nacelle and hub. The training also includes casualty handling techniques and the selection, inspection and use of equipment.

The emergency services' ability to provide rescue from height has improved considerably since the publication of HSE's *Operational Circular 200/31*.[7] Many are now able to provide advice on evacuation and rescue when planning rescue from height within wind turbines.

In terms of making arrangements for the rescue of personnel, wind turbine operators should include the selection of suitable rescue equipment, training of users, and bringing equipment to the required location.

Should a fire ever break out in the nacelle, escape would either be down the tower or, if the fire/smoke is located in the tower, by external descent. For offshore wind turbines, evacuation will be determined by a risk assessment of the site. This needs to take into account wind speed, whether it's possible to land on the external platform, the sea temperature and potential time to rescue the person(s) from the water.[8]

Maintenance workers that repair the blades on the turbines will need a solid grasp of rope access techniques. With this in mind, it's essential that rope access teams can attach to the system in a place of safety, that they prevent ropes from passing over sharp edges, and that they can access separate anchorages for working and back-up ropes.[9]

There is much to be gained from multi-agency exercises, to test the arrangements in place for the deployment of rescue equipment. It frequently leads to recommendations for the improvement of rescue planning and, in some instances, the installation of new equipment. Exercises also identify skills gaps, requiring an assessment of further specialist training or refreshers.

Offshore rescues are challenging, particularly those involving rescue from hub to nacelle, nacelle to transition piece, transition piece to vessel, vessel to vessel and, finally, vessel to shore. Depending on the location, this can take anything up to two hours. ■

References

References for this article are available online at www.shponline.co.uk/features/features/full/remote-rescue

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