

Offshore Helidecks

PAFA Consulting Engineers have data and specifications relevant to the design and construction of offshore helidecks. Present criteria assume helidecks are steel or aluminium equivalents, with no provision made for the assessment of aluminium helidecks currently in widespread use.

The main failure mode for an aluminium helideck was the stiffener web; predominantly web buckling, with web crippling being a contributing cause in several cases. The parameters influencing locally loaded decks were reviewed, the most influential being panel slenderness and width to patch width ratio.

The predictions of five Class Society closed-form procedures for helideck plating were compared with test results. The most accurate predictions is 15%, with test values averaging 38% higher than the best predictions. None allows permanent set to develop in plating.

Guidance developed by PAFA Consulting Engineers for the HSE specifically caters for aluminium decks.¹ Some of these guidelines are reflected in the proposed ISO Standard for Topside Structures, ISO 19901-3.

These first-principle procedures have accuracies at least equivalent to the best of the Class Society formulations and by including an aspect ratio effect improve accuracy to 12%. Web buckling or crippling is a likely failure mode for stiffened decks with trapezoidal stiffeners. Existing requirements do not consider this possibility. The conduct of a risk assessment on helideck failure is recommended.

A review of weather sensitive operations highlighted the need for high-quality site information and forecasts.²

¹ OTO 2001 072. "Helideck Structural Requirements".

² OTO 2001 022. "Weather-sensitive offshore operations and Metocean data".

Summary

- Review of helideck structural requirements
- Existing methods are very conservative and do not allow for permanent set
- More accurate formulae addresses aluminium decks, aspect ratio and web buckling effects.
- Use of risk assessment is recommended
- Reducing limits on weather sensitive operations have also been investigated

Clients

- Health & Safety Executive
- Consultavia
- UKOOA

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