

Fibre Reinforced Plastic (FRP) deck gratings

What happened?

During a recent facility inspection, a NOPSEMA inspector observed Fibre Reinforced Plastic (FRP) deck gratings were being used as a part of the designated emergency exit route across a facility. Upon further investigation, it was discovered a decision to replace the original steel grating with FRP grating had not considered the vulnerability of FRP grating to hydrocarbon fires. This was of concern given recent warnings about potential failures of fire resistant composite materials used offshore (see 'References' section below). Furthermore, it was apparent the operator had failed to consider all implications of changing materials and was informed of the need to reassess their decision to ensure that the risks associated with FRP were reduced to as low as reasonably practicable (ALARP).

What could go wrong?

FRP deck gratings have the potential to appear undamaged after being exposed to hydrocarbon fires and can catastrophically fail while under the load of an individual. For example, a worker who runs over the grating has the potential to fall and encounter serious injury.



Figure 1 FRP (left) and steel (right) gratings post dynamic testing.

Image courtesy of Health and Safety Executive, United Kingdom

Key lessons

- Operators should ensure that when proposing to make a change they take all reasonably practicable steps to source available safety information related to the change, and act on it where appropriate.
- FRP grating has been shown to be vulnerable to hydrocarbon fires and its use on an offshore facility needs to be assessed to ensure that risks associated with its use are ALARP.
- If facility operators use FRP grating they need to clearly define the performance required of the grating. For example the temperature and duration of fire that the FRP should resist and still subsequently support a minimum weight under dynamic conditions.
- The performance required of the FRP grating should then be compared against the performance described by suppliers to ensure that the FRP grating can meet its required performance.

The legislation

Clause 9 of Schedule 3 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* requires that “The operator of a facility must take all reasonably practicable steps to ensure that the facility is safe and without risk to the health of any person at or near the facility.” This includes an obligation to take all reasonable practicable steps to:

- implement and maintain appropriate procedures and equipment for the control of, and response to, emergencies at the facility [Clause 9(2)(e)]; and
- provide all members of the workforce with the information, training and supervision necessary for them to carry out their activities in a manner that does not adversely affect the safety of persons at the facility [Clause 9(2)(f)].

References

The following oil and gas publications provide further information on the issue of FRP deck grating vulnerability:

1. Health and Safety Executive. (2012). HID 2-2012 - Warning to offshore industry on possible failure of fire resistant composite deck gratings. Retrieved from <http://www.hse.gov.uk/safetybulletins/deck-gratings.htm?eban=govdel-offshore-bulletin&cr=02-Oct-2012#>
2. Health and Safety Executive. (2012). RR950 - Preliminary fire testing of composite offshore pedestrian gratings. Retrieved from <http://www.hse.gov.uk/research/rrhtm/rr950.htm>
3. Oil and Gas UK. 2013. Technical Note - Subject: Fire Resistance of Composite Grating. Retrieved from <http://www.oilandgasuk.co.uk/templates/asset-relay.cfm?frmAssetFileID=3194>

Contact

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