

## ***Failure of Galvanised Lighting Mast Welded Base Support***

**Platform/Site/Area:** *Drilling Platform 6 (DP6) Weather Deck, Morecambe Bay East Irish Sea*

**Date of Incident:** *13<sup>th</sup> October 2013*

**Issued by:** *Steve Bowskill, Senior Mechanical Integrity Engineer, Asset Integrity Dept*

**Approved by:** *Mark McGowan, HSEQ Manager 6<sup>th</sup> November 2013.*

### **Details of Event:**

*During the manual operation of raising a high level lighting mast on the weather deck to provide increased lighting levels during hours of darkness in the winter months a base weld failed causing the unit to fall back to its support rest position. There was a potential for the lighting mast to fall off the support frame and drop approximately 8 metres below to a cellar deck walkway area.*

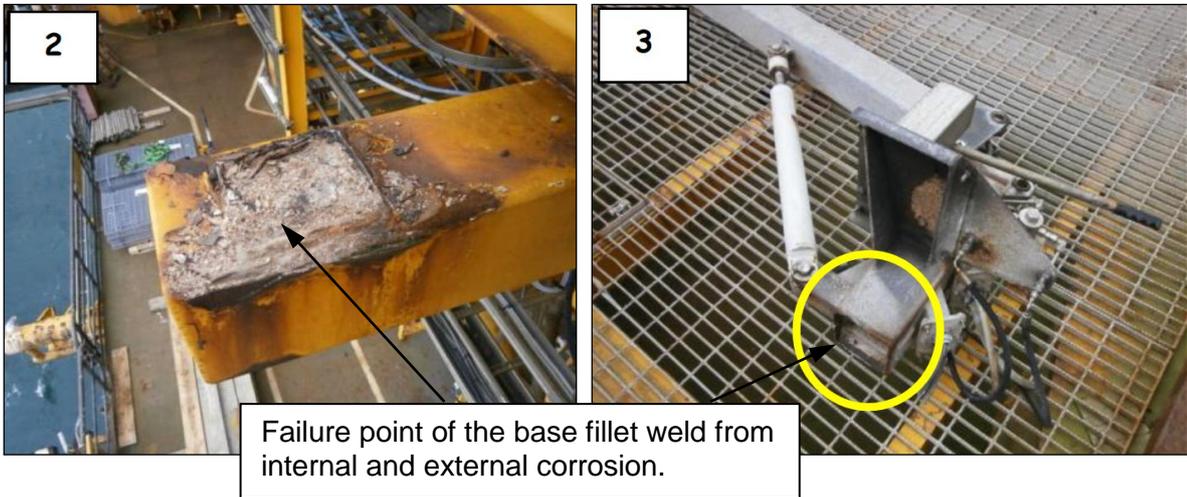


Typical arrangements of a lighting mast in the vertical (operational) and the horizontal (maintenance or storage) positions.



*The masts installed were of a box section construction hot dipped galvanised provided by a vendor during construction of the offshore platforms approximately 30 years ago. The units were then welded to support structural steelwork around the perimeter of the platforms. Paint coatings were then applied to the outside surfaces of the steelwork support and weld.*

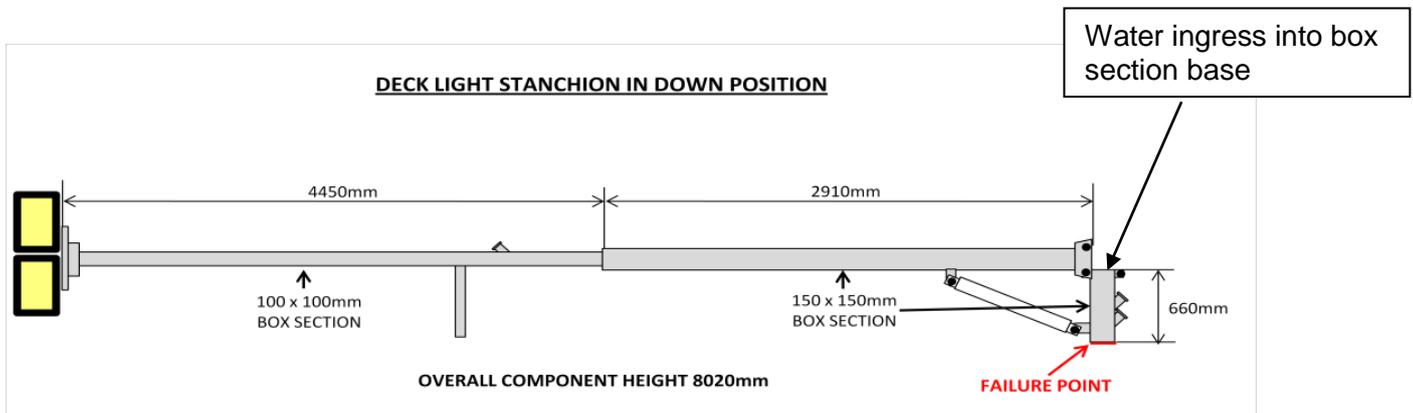
The lighting mast has a construction design that allows the box section to trap rainwater while in the horizontal position that cannot drain away unless effective modifications have been made. The action of welding galvanised components to other carbon steel structures causes a heat affected zone and for the zinc coating of the galvanisation process to melt and vaporise away from the immediate surface area due to the temperature of the welding process. If no surface protection or recoating with a zinc rich system is carried out the area will be subjected to increased corrosion rates.

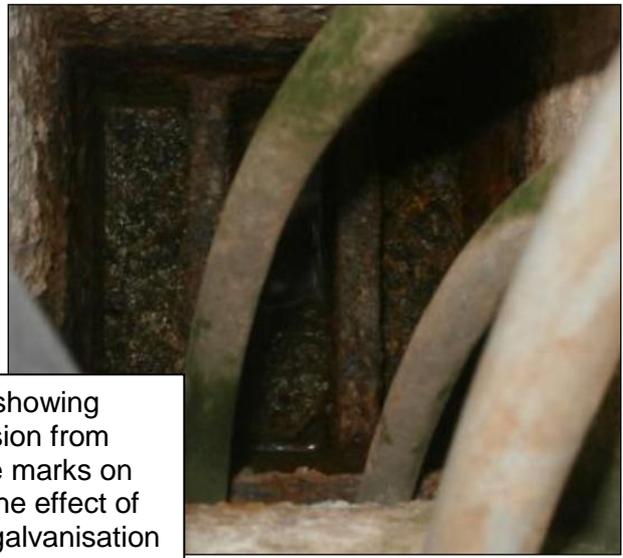


The weld is also a simple fillet weld on the box section and flat surface with minimal penetration. Wicking of the rain water will occur under the box section flat end and then up the inside line between the weld and the box section which can give rise to internal cracks/weld failure that are not always obvious from external visual inspections especially if the external surface coating has been recently maintained.

Due to the geometry of this type of equipment the use of standard inspection techniques such as UT and radiography will not give reliable results and other inspection processes such as MPI, Eddy Current and ACFM will only give an indication of defects at the latter stage of degradation when the majority of strength has been lost in the weld.

Other masts installed on the platforms have an improved design where the box section base is welded to a mounting plate then galvanised and bolted to the platform steelwork. This style has a significantly reduced corrosion rate and still fit for purpose.





Base of box section stand showing internal and external corrosion from standing water. Typical tide marks on inside of another unit and the effect of welding showing a loss of galvanisation just above the weld with corrosion developing between the weld and the box base. Remaining weld connected to support but broken away from the box section of failed unit.

14



## **Recommendations:**

- 1. Ensure suitable permits and/or Point of Work Risk Assessments are carried out for the level of routine tasks being completed that contain suitable assessments for fitness of equipment about to be operated.*
- 2. To survey the assets that you are responsible for and identify areas where these types of masts are used or similar equipment that has a galvanised base to a carbon steel frame/support weld.*
- 3. Assess the design of the lighting masts to improve the anchoring or support of the base unit box section. Risk assess the units in the short term to identify if temporary supports are required until long term design solution implemented*
- 4. Carry out suitable Fabric Maintenance externally and where access allows internally, to protect surfaces prone to dissimilar metals/HAZ corrosion from atmospheric conditions/water ingress*
- 5. Carry out suitable inspection techniques such as MPI, Eddy Current or Alternating Current Field Measurement (ACFM) to confirm weld connection still has integrity in similar situations. Review the inspection technique for the application as not all methods can be reliable in some cases. Provide a suitable certification process for these items to give Operations confidence that units are fit for purpose.*
- 6. Protect the entry points from water ingress and/or provide suitable drain points to prevent water build up inside.*
- 7. Any lighting units or equipment that are suspected of having internal/external corrosion build up that will affect the structural or pressure boundary integrity should be suitably supported, isolated electrically and mechanically as appropriate, recorded in local isolation records/certs and subsequent timely plans put in place to repair, replace or remove.*

**For further information:**

**Telephone +44 (0)1524 864765**

**Fax: +44(0)1524 864864**

**Or email: [steve.bowskill@centrica.com](mailto:steve.bowskill@centrica.com) or [john.watson1@centrica.com](mailto:john.watson1@centrica.com)**

*This safety bulletin provides awareness of a summary only of the subject matter covered for the purposes of health and safety. Centrica Energy assumes no responsibility to outside parties for any action they may take in relation to the content of this safety bulletin, in so ever and how so ever construed, interpreted or otherwise acted upon.*