

MMI specialises in the development of structure specific, and generic, vulnerability profiles for various types of offshore oil and gas installations when exposed to storms. These profiles take the form of damage ratio versus wave height or storm intensity. The damage ratio is a measure of the cost of repair to the cost of replacing the installation.



We have extensive experience in the development of vulnerability curves, with particular expertise developing curves for structures that are commonly utilized in the offshore Gulf of Mexico oil and gas industry. The curves assess platform vulnerability to wave loading and hence, when combined with a wave hazard function, enable an informed judgment to be made as to the financial risk faced by clients for any given Gulf of Mexico installation. The curves may be used with the output of hazard prediction tools that generate the wind speed and wave height data.

For example, MMI undertook a platform vulnerability study for a major re-issuer to assess the vulnerability of various classes of fixed installations that are currently in-service in the UK Sector of the North Sea. The output from the study was a series of curves that predicted financial loss versus wave height (a function of windspeed) and included wind damage, providing an input into the client's financial risk model for such installations.

The study developed methodologies for predicting the loss potential of the following classes of structures:

- Steel jackets
- Concrete gravity based structures
- Tension leg platforms
- Converted jack-ups
- Mono-towers

The methodologies developed included consideration of:

- Structural configuration
- Wave-in-deck loading
- Wave run-up
- Platform functionality
- Location within the North Sea
- Age of platform

The vulnerability models were developed in such a manner as to enable individual platform data to be used to develop an installation specific vulnerability profile.