Problem Statement.

Over 25 years, The Irish Naval Service (INS) has safely operated over ten davits based on three different load categories. These davits are essential to the capacity of the INS to undertake their role and are subject to heavy usage while a vessel is deployed. The davit's structural integrity is critical to the safety of the personnel onboard the Rigid inflatable Boat at the point of deployment and recovery. During their service life, the davits have been operated successfully by the INS. However, given the high frequency of load cycles to which the davit structure is subject to, it merits engineering discussions on the desired characteristic of the long-term structural integrity considering fatigue data.

Some davits are now approaching their midlife expectancy and were designed before Finite Element Analysis (FEA) was developed by the Original Equipment Manufacturer (OEM) to the extent that you could undertake analysis of complex structures like these C-Frame davits. However, The Code for Lifting Appliances in a Marine Environment (CLAME) in 2019 also gives the caveat that fatigue calculations are to be carried out in accordance with a recognised National Standard using load cycles and load spectrum agreed between the (OEM) and the owner. Hence new data would be obtained throughout the project.

Project Aim.

This research aims to determine a holistic overview and proposed course of action in evaluating the structural integrity and risks associated with the long-term operation of the davit.

Project Objectives.

- **Review of Operating Frequency & Parameters.**
  Understanding the operational frequency of a davit is the basis for predicting its service life. Although the davit is designed to be substantially over-engineered for their design load, subjecting a structure to such a high number of operational cycles increases the long-term risk of fatigue-induced failure.
- **Reclassification from Rescue to Workboat Status.**
  These Boat davits comply with Fast Rescue Craft (FRC) certification. However, it is argued, davits may be operated in a workboat capacity; therefore, we would like to reconsider the option of reclassifying the davits from FRC to workboat status.
- **Characterize Operational stress.**
  We will verify the accuracy of theoretical predictions acquired through desk-based theoretical analysis by employing load/stress monitoring within the structure of the davit whilst it is operational at sea.

Conclusions and Recommendations.

Data acquired through measurements, load/stress modelling, and inspection will be evaluated and used as a basis to consider the current maintenance and testing practices. A better understanding of the rate at which 'wear and tear' occurs can be used to optimise maintenance scheduling and evaluate the allowable long-term safe operating life of each davit.