7 RECOMMENDATIONS FOR FUTURE RESEACH

In this study, the fatigue life of the mast was checked only for one wind speed which is the 1 in 500 year return period wind for which the tower is designed to withstand. But there will be different wind speeds and they will induced different cyclic stress amplitudes. These will also make contributions to the fatigue life. Hence fatigue life at different wind speeds should be found and they should be combined using the miners rule to find out the fatigue design life (in years) of the structure. This require the wind data distributions for 300m level at the mast location. Estimation of fatigue life in years will help the designer optimize the plate thickness and opening shape.

This study is focused on the fatigue life induced by the plate because of the hole. But there are more fatigue inducing details such as connections. These connections are often the main stress concentrations and they are highly vulnerable to fatigue damage. Hence it is recommended to simulate fatigue for the connections as well. Fatigue analysis of welds can be done using the verity feature given in the fe-safe software. Fatigue analysis of bolts will require very fine details. Hence it is recommended to use sub-modelling tool which is available in Abaqus software. It will enhance the computational efficiency.

The fatigue analysis for case study has been performed for wind induced fatigue. The earthquakes which are recently seen in Nepal and the nearby area of Sri Lanka indicate that there Sri Lanka has some probability of earthquakes. Hence the mast should be designed for earthquake induced fatigue as well.

There are many tall steel structures and large span steel bridges in Sri Lanka. Fatigue simulations have not been done for them yet. Hence performing fatigue simulations for those existing structures will help improve the safety of Sri Lankan citizens.