0D and 1D models are developed for the simulation of ECR assisted plasma start-up in Steady-state Superconducting Tokamak, SST-1 and its evolution is presented.

The simulation results are validated quantitatively with the experimental measurements from SST-1 discharges (Shot# 7496).

Reasonably good agreement of plasma current is seen between the simulation and experimental waveforms. Simulated electron temperature and density shows fast build-up as compared to the experimental data.

However, the simulation result and the measured densities approach the similar absolute values with time.

The results of this study indicate that the plasma evolution is a sensitive to the applied loop voltage, ECW power, impurity concentration, error field and initial pre-fill gas pressure.

Controlling the initial hydrogen atom density, suppressing the error field, and reducing the impurity density are all useful for reliable plasma start-up.