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Austenite stabilization through partitioning of alloying elements from martensite into austenite is a key aspect in the Q&P process. In the current research, two low carbon, medium manganese steels with varying content of nickel, strong austenite stabilizer, are investigated to elucidate the influence of nickel on austenite stability. After partitioning at 400 °C and 600 °C, retained austenite fractions in the final microstructures rise with increasing holding time. In contrast, intermediate partitioning temperature of 500 °C promotes pearlite and carbide formation in austenite, that compete for the carbon available for partitioning, and decrease the retained austenite fractions with time. Results indicate that the addition of nickel slow down the kinetics of competitive reactions during the partitioning stage and significantly increases the fraction of retained austenite. The current in-detail study on the impact of nickel on austenite stability provides new strategies to tailor the Q&P microstructure in this family of alloys.