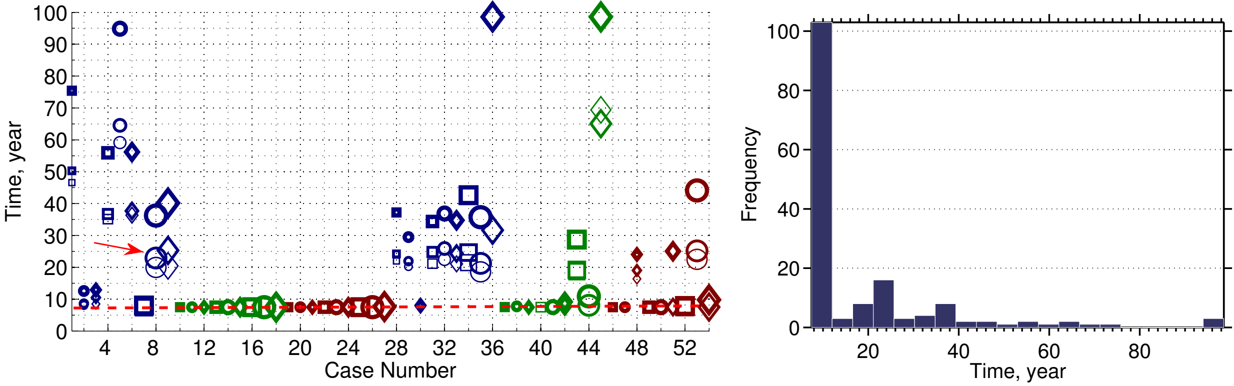

(a) Case plot of injection time in all cases.

(b) Histogram

Figure 9: Time to inject a quarter of the total specified CO_2 volume for all cases in the pressure-constrained scenario. The dashed red line in the left plot denotes the targeted injection time of 7.5 years, and the red arrow points to the case shown in Figure 8. (The case numbers refer to the different petrophysical realizations; in addition, each realization can have three different degrees of faulting. See Table 3.)

4.1 Injection time

In the pressure-constrained scenario, the lower the injectivity of the well is, the longer it will take to inject into the medium, if the pressure is to be kept below the critical limit. In some of the cases it takes longer than 100 years (i.e., longer than the total simulation time) to inject the specified CO_2 volume. To compare cases, we therefore calculate the time at which a quarter of the targeted volume is injected, which is less than 100 years for all simulation cases.

Figure 9 shows the injection time for all cases in the pressure-constrained scenario. For many cases, the injector keeps the target rate and thus completes the injection within the planned time period of 7.5 years (the dashed red line in the figure). The rest of the cases require longer injection time because of the lower injectivity of the medium. This leads to pressure control in the injector, followed by a decrease in the injection rate. In almost all the realizations with low aggradation angle, shown in blue color (Table 3), the injection rate is reduced below the constant target rate. Also cases with closed faults, denoted by thick markers, have (significantly) longer injection time. The effect of progradation direction is apparent in realizations with higher aggradation angle: for some of the cases colored green and red in the right half of the plot in Figure 9, injection takes longer than the corresponding cases in the left half. Therefore, down-dip progradation, independent of aggradation angle, can result in lower injectivity.