

$$\begin{aligned}
& \text{assign} : (sd : \text{SD}) \rightarrow (sd' : \text{SD}) \rightarrow (\text{S} \Rightarrow_s \text{Compl}) \, sd \\
& \quad \rightarrow sd \leq_s sd' \rightarrow \text{R} \, sd' \rightarrow \text{I} \, sd' \\
& \text{assign} \langle f, d \rangle \langle f', d' \rangle \beta \, sd \leq_s sd' \, r \text{ with } (\leq\text{-compare} \{ \text{succ} \, d \} \{ d' \}) \\
& \dots \mid \text{leq} \, \delta_1 \leq \delta_2 \\
& \quad = \text{assign-dec} \\
& \quad \quad ((d' - (\text{succ} \, d)) \, \delta_1 \leq \delta_2) \, (\rightarrow \leq \, \delta_1 \leq \delta_2) \\
& \quad \quad (\text{l-var} \langle f, d \rangle \\
& \quad \quad \quad (sd \leq_s sd' \rightarrow sd \leq_s sd' -_s [d' - [\text{succ} \, d]] \, sd \leq_s sd' \, \delta_1 \leq \delta_2)) \\
& \quad \quad r \\
& \quad \quad (\beta ((sd \leq_s sd' \rightarrow sd \leq_s sd' -_s [d' - [\text{succ} \, d]] \, sd \leq_s sd' \, \delta_1 \leq \delta_2)) \\
& \quad \quad \quad (\text{s-l} (\text{l-var} \langle f, d \rangle \\
& \quad \quad \quad \quad ((sd \leq_s sd' \rightarrow sd \leq_s sd' -_s [d' - [\text{succ} \, d]] \, sd \leq_s sd' \, \delta_1 \leq \delta_2))))))
\end{aligned}$$

$$\begin{aligned}
& \dots \mid \text{geq} \, \delta_2 \leq \delta_1 = \text{assign-inc} (((\text{succ} \, d) - d') \, \delta_2 \leq \delta_1) \\
& \quad (\text{l-var} \langle f, d \rangle (\leq_s\text{-trans} \, sd \leq_s sd' \, +_s \rightarrow \leq_s)) \, r \\
& \quad (\beta ((\leq_s\text{-trans} \, sd \leq_s sd' \, +_s \rightarrow \leq_s)) \\
& \quad \quad (\text{s-l} (\text{l-var} \langle f, d \rangle ((\leq_s\text{-trans} \, sd \leq_s sd' \, +_s \rightarrow \leq_s))))))
\end{aligned}$$

$$\begin{aligned}
& \text{use-temp} : \forall \{sd \, sd'\} \rightarrow (\text{S} \Rightarrow_s \text{Compl}) \, sd \rightarrow sd \leq_s sd' \rightarrow \text{R} \, sd' \rightarrow \text{I} \, sd' \\
& \text{use-temp} \, \beta \, sd \leq_s sd' \, (\text{r-s} \, s) = \beta \, sd \leq_s sd' \, s \\
& \text{use-temp} \, \{sd\} \, \{sd'\} \, \beta \, sd \leq_s sd' \, (\text{r-unary} \, uop \, s) = \\
& \quad \text{assign} \, sd \, sd' \, \beta \, sd \leq_s sd' \, (\text{r-unary} \, uop \, s) \\
& \text{use-temp} \, \{sd\} \, \{sd'\} \, \beta \, sd \leq_s sd' \, (\text{r-binary} \, s_1 \, bop \, s_2) = \\
& \quad \text{assign} \, sd \, sd' \, \beta \, sd \leq_s sd' \, (\text{r-binary} \, s_1 \, bop \, s_2)
\end{aligned}$$