$$
\begin{array}{l}
\mathit{HardRingCorrectness} \triangleq \\
\quad \land \forall\, t \in \mathit{TaskSet} : \land \Box(\mathit{Len}(\mathit{TaskState}[\mathit{taskId}(t)].\mathit{msg}) \leq 3) \\
\qquad\qquad\qquad\qquad \land \Box\Diamond \text{ENABLED } \mathit{SendElem}(t) \\
\quad \land \Box(\text{ENABLED } \mathit{NextChip} \Rightarrow \mathit{History}.\mathit{elem} = \mathit{Shared}.\mathit{chipCount}) \\
\\
\mathit{ReservationSafety} \triangleq \\
\quad \Box\, \forall\, \mathit{chip},\, j \in \mathit{Task} : \land \text{ENABLED } \mathit{SendRese}(T[j]) \\
\qquad\qquad\qquad\qquad\qquad\quad \land \mathit{Shared}.\mathit{chipCount} = \mathit{chip} \\
\qquad\quad \Rightarrow \land \mathit{TaskState}[j].\mathit{res}[\mathit{chip}] = j \\
\qquad\qquad\quad \land \forall\, i \in \mathit{Task} \setminus \{j\} : \mathit{TaskState}[i].\mathit{res}[\mathit{chip}] \in \{j,\ -1\} \\
\\
\mathit{SoftRingFairness} \triangleq \\
\quad \land \forall\, i \in \mathit{Proc} : \Box(\text{IF } i \in \mathit{Shared}.\mathit{proc} \\
\qquad\qquad\qquad\qquad\quad \text{THEN } \mathit{ProcState}[i].\mathit{list} \neq \langle\rangle \Rightarrow \Diamond(i = \mathit{ProcState}[i].\mathit{token}) \\
\qquad\qquad\qquad\qquad\quad \text{ELSE TRUE}) \\
\quad \land \Box\Diamond(\forall\, i \in \mathit{Proc} \setminus \mathit{Failed} : \text{IF } i \in \mathit{Shared}.\mathit{proc} \\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad \text{THEN } \mathit{Len}(\mathit{ProcState}[i].\mathit{list}) = 0 \\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad \text{ELSE TRUE})
\end{array}
$$