$$
\begin{aligned}
&\mathsf{unroll_p}(T, P, k) = \text{match } k \text{ with} \\
&\quad \mid 0 \mapsto P(0) \\
&\quad \mid 1 \mapsto P(0) \wedge T(0, 1) \\
&\quad \mid _ \mapsto \mathsf{unroll_p}(T, P, k-1) \wedge P(k-1) \wedge T(k-1, k)
\end{aligned}
$$

$$
\begin{aligned}
&\mathsf{unroll_i}(T, I, k) = \text{match } k \text{ with} \\
&\quad \mid 0 \mapsto I(0) \\
&\quad \mid _ \mapsto \mathsf{unroll_i}(T, I, k-1) \wedge T(k-1, k)
\end{aligned}
$$

$$
\mathsf{step}(T, P, k) = \mathsf{unroll_p}(T, P, k) \wedge \neg P(k)
$$

$$
\mathsf{base}(I, T, P, k) = \mathsf{base_k}(I, T, P, k-1)
$$

$$
\begin{aligned}
&\mathsf{base_k}(I, T, P, k) = \text{match } k \text{ with} \\
&\quad \mid 0 \mapsto I(0) \wedge \neg P(0) \\
&\quad \mid _ \mapsto \mathsf{base_k}(I, T, P, k-1) \vee \\
&\qquad\quad (\mathsf{unroll_i}(T, I, k-1) \wedge \neg P(k))
\end{aligned}
$$