

chain-consistent-fails-before^{13,45}

$\forall es:ES, Cmd:Type, In:AbsInterface(Cmd), isupdate:(Cmd \rightarrow \mathbb{B}), Sys, Out:AbsInterface(Top).$
 $(E(In) \subseteq_r E(Sys))$
 $\Rightarrow (\forall f:sys\text{-antecedent}(es;Sys).$
 $(\forall e:E(In). f(e) = e \in E)$
 $\Rightarrow (\forall chain:(E(Sys) \rightarrow (Id\ List)).$
 $chain\text{-consistent}(f;chain)$
 $\Rightarrow (\forall x, y:Id.$
 $cr\text{-fails-before}(es; Sys; chain; x; y)$
 $\Rightarrow (\forall e:E(Sys). (x \in chain(e)) \Rightarrow (y \in chain(e))))))$