EState^{0,22}

EventsWithState
$\equiv_{\text{def}}$ E:Type
$\times$EqDecider(E)
$\times$*pred*?:($E\rightarrow(E+\text{Unit})$)
$\times$*info*:($E\rightarrow(\text{Id}\times\text{Id}+(\text{IdLnk}\times E)\times\text{Id})$)
$\times$EOrderAxioms(E; *pred*?; *info*)
$\times T$:(Id$\rightarrow$Id$\rightarrow$Type)
$\times V$:(Id$\rightarrow$Id$\rightarrow$Type)
$\times M$:(IdLnk$\rightarrow$Id$\rightarrow$Type)
$\times$*init*:(i,x:Id$\rightarrow T(i,x)$)
$\times$*Trans*:(i:Id$\rightarrow k$:Knd$\rightarrow$kindcase(k; $a.V(i,a)$; $l,t.M(l,t)$)$\rightarrow$(x:Id$\rightarrow T(i,x)$)$\rightarrow$(x:Id$\rightarrow T(i,x)$))
$\times$*val*:(e:$E\rightarrow$kindcase(kind(e); $a.V(\text{loc}(e),a)$; $l,t.M(l,t)$))
$\times$*Send*:(i:Id$\rightarrow k$:Knd$\rightarrow$kindcase(k; $a.V(i,a)$; $l,t.M(l,t)$)$\rightarrow$(x:Id$\rightarrow T(i,x)$)$\rightarrow$
(Msg(M) List))
$\times$*Choose*:(i,a:Id$\rightarrow$(x:Id$\rightarrow T(i,x)$)$\rightarrow$($V(i,a)$+Unit))
$\times$val-axiom(E;V;M;*info*;*pred*?;
init;*Trans*;*Choose*;
Send;*val*)
$\times$(($\forall i$, x:Id. AtomFree(Type;$T(i,x)$))
& ($\forall i$, a:Id. AtomFree(Type;$V(i,a)$))
& ($\forall l$:IdLnk, tg:Id. AtomFree(Type;$M(l,tg)$)))
$\times$Top

clarification:

EState{i:l}
$\equiv_{\text{def}}$ E:Type$_{\text{i}}$
$\times$EqDecider(E)
$\times$*pred*?:($E\rightarrow(E+\text{Unit})$)
$\times$*info*:($E\rightarrow(\text{Id}\times\text{Id}+(\text{IdLnk}\times E)\times\text{Id})$)
$\times$EOrderAxioms{i}(E;
pred?;
info)
$\times T$:(Id$\rightarrow$Id$\rightarrow$Type$_{\text{i}}$)
$\times V$:(Id$\rightarrow$Id$\rightarrow$Type$_{\text{i}}$)
$\times M$:(IdLnk$\rightarrow$Id$\rightarrow$Type$_{\text{i}}$)
$\times$*init*:(i:Id$\rightarrow x$:Id$\rightarrow T(i,x)$)
$\times$*Trans*:(i:Id$\rightarrow k$:Knd$\rightarrow$kindcase(k; $a.V(i,a)$; $l,t.M(l,t)$)$\rightarrow$(x:Id$\rightarrow T(i,x)$)$\rightarrow$(x:Id$\rightarrow T(i,x)$))

$\times\, \mathit{val}{:}(e{:}E \rightarrow \mathrm{kindcase}(\mathrm{kind}(\mathit{info};e);\ a.V(\mathrm{loc}(\mathit{info};e),a);\ l,t.M(l,t)\ ))$
$\times\, \mathit{Send}{:}(i{:}\mathrm{Id} \rightarrow k{:}\mathrm{Knd} \rightarrow \mathrm{kindcase}(k;\ a.V(i,a);\ l,t.M(l,t)\ ) \rightarrow (x{:}\mathrm{Id} \rightarrow T(i,x)) \rightarrow$
$\quad (\mathrm{Msg}(M)\ \mathrm{List}))$
$\times\, \mathit{Choose}{:}(i{:}\mathrm{Id} \rightarrow a{:}\mathrm{Id} \rightarrow (x{:}\mathrm{Id} \rightarrow T(i,x)) \rightarrow (V(i,a) + \mathrm{Unit}))$
$\times\, \mathrm{val\text{-}axiom}(E;V;M;\mathit{info};\mathit{pred}?;$
$\quad \mathit{init};\mathit{Trans};\mathit{Choose};$
$\quad \mathit{Send};\mathit{val})$
$\times\, ((\forall i{:}\mathrm{Id},\ x{:}\mathrm{Id}.\ \mathrm{AtomFree}(\mathrm{Type_i};T(i,x)))$
$\quad \&\ (\forall i{:}\mathrm{Id},\ a{:}\mathrm{Id}.\ \mathrm{AtomFree}(\mathrm{Type_i};V(i,a)))$
$\quad \&\ (\forall l{:}\mathrm{IdLnk},\ tg{:}\mathrm{Id}.\ \mathrm{AtomFree}(\mathrm{Type_i};M(l,tg))))$
$\times\, \mathrm{Top}$

http://www.cs.cornell.edu/Info/Projects/NuPrl/FDLcontent/p0_286125_/p19_301084_{EState}.html