

section *ProgramEnv* **parents** *scj_prelude, MissionId, SchedulableId*

[*Name*]
 [*Method*]
 [*Type*]
MethodSet == \mathbb{P} *Method*

ObjectEnv _____

name : *Name*
variables : seq *Name*
methods : *MethodSet*

addMethod _____

Δ *ObjectEnv*
m? : *Method*

m \notin *methods*
methods' = *methods* \cup {*m?*}
name' = *name*
variables' = *variables*

setName _____

Δ *ObjectEnv*
n? : *Name*

name' = *n?*
variables' = *variables*
methods' = *methods*

SafeletEnv == *ObjectEnv*
MissionEnv == *ObjectEnv*
MissionSequencerEnv == *ObjectEnv*
PeriodicEventHandlerEnv == *ObjectEnv*
AperiodicEventHandlerEnv == *ObjectEnv*
OneShotEventHandlerEnv == *ObjectEnv*
ManagedThreadEnv == *ObjectEnv*

nullSafeletEnv : *SafeletEnv*
nullMissionEnv : *MissionEnv*
nullMissionSequencerEnv : *MissionSequencerEnv*
nullPeriodicEventHandlerEnv : *PeriodicEventHandlerEnv*
nullAperiodicEventHandlerEnv : *AperiodicEventHandlerEnv*
nullOneShotEventHandlerEnv : *OneShotEventHandlerEnv*
nullManagedThreadEnv : *ManagedThreadEnv*

TopLevelMissionSequencerEnv == *MissionSequencerEnv*
SchedulableMissionSequencerEnv == *MissionSequencerEnv*

SchedulablesEnv _____

Periodics : seq *PeriodicEventHandlerEnv*
Aperiodics : seq *AperiodicEventHandlerEnv*
OneShots : seq *OneShotEventHandlerEnv*
NestedSequencers : seq *SchedulableMissionSequencerEnv*
ManagedThreads : seq *ManagedThreadEnv*

<i>ClusterEnv</i>	$ \begin{array}{l} \text{Sequencer} : \text{MissionSequencerEnv} \\ \text{Mission} : \text{MissionEnv} \\ \text{Schedulables} : \text{SchedulablesEnv} \\ \hline \text{Schedulables.NestedSequencers} \upharpoonright \{\text{Sequencer}\} = \langle \rangle \end{array} $
<i>getMission</i>	$ \begin{array}{l} \exists \text{ClusterEnv} \\ \text{mission!} : \text{MissionEnv} \\ \hline \text{mission!} = \text{Mission} \end{array} $
<i>TierEnv</i>	$ \begin{array}{l} \text{Clusters} : \text{seq ClusterEnv} \end{array} $
<i>ControlTierEnv</i>	$ \begin{array}{l} \text{Safelet} : \text{SafeletEnv} \\ \text{TopLevelSequencers} : \text{seq TopLevelMissionSequencerEnv} \end{array} $
<i>StructureEnv</i>	$ \begin{array}{l} \text{ControlTier} : \text{ControlTierEnv} \\ \text{Tiers} : \text{seq TierEnv} \\ \text{CurrentTier} : \text{TierEnv} \\ \text{CurrentCluster} : \text{ClusterEnv} \end{array} $
<i>newTier</i>	$ \begin{array}{l} \Delta \text{StructureEnv} \\ \hline \exists t : \text{TierEnv} \mid t.\text{Clusters} = \langle \rangle \wedge \text{Tiers} \upharpoonright \{t\} = \langle \rangle \\ \quad \bullet \text{CurrentTier}' = t \wedge \text{Tiers}' = \text{Tiers} \frown \langle t \rangle \\ \text{ControlTier}' = \text{ControlTier} \\ \text{CurrentCluster}' = \text{CurrentCluster} \end{array} $
<i>newCluster</i>	$ \begin{array}{l} \Delta \text{StructureEnv} \\ s? : \text{MissionSequencerEnv} \\ \hline \exists c : \text{ClusterEnv} \mid c.\text{Mission} = \text{nullMissionEnv} \wedge c.\text{Sequencer} = s? \\ \quad \text{CurrentTier.Clusters} \upharpoonright \{c\} = \langle \rangle \\ \quad \bullet \text{CurrentCluster}' = c \wedge \text{CurrentTier}'.\text{Clusters} = \text{CurrentTier.Clusters} \frown \langle c \rangle \wedge \\ \text{CurrentTier}' = \text{CurrentTier} \\ \text{ControlTier}' = \text{ControlTier} \\ \text{Tiers}' = \text{Tiers} \end{array} $
<i>setSafelet</i>	$ \begin{array}{l} \Delta \text{ControlTierEnv} \\ s? : \text{SafeletEnv} \\ \hline \text{Safelet}' = s? \\ \text{TopLevelSequencers}' = \text{TopLevelSequencers} \end{array} $

<i>addTopLevelSequencer</i> $\Delta \text{ControlTierEnv}$ $t? : \text{TopLevelMissionSequencerEnv}$
$\text{TopLevelSequencers} \upharpoonright \{t?\} = \langle \rangle$ $\text{TopLevelSequencers}' = \text{TopLevelSequencers} \hat{\ } \langle t? \rangle$ $\text{Safelet}' = \text{Safelet}$
<i>addMission</i> $\Delta \text{StructureEnv}$ $m? : \text{MissionEnv}$
$\text{CurrentCluster.Mission} = \text{nullMissionEnv}$ $\text{CurrentCluster}'.\text{Mission} = m?$ $\text{CurrentCluster}' = \text{CurrentCluster}$ $\text{CurrentTier}' = \text{CurrentTier}$ $\text{ControlTier}' = \text{ControlTier}$ $\text{Tiers}' = \text{Tiers}$
<i>ProgramEnv</i> $\text{Structure} : \text{StructureEnv}$ $\text{NonSCJObjects} : \mathbb{P} \text{ObjectEnv}$