MACHINE m1
REFINES m0
SEES c0
VARIABLES

wait
process
clk
t1
t2
t3

INVARIANTS

inv1: $clk \in \mathbb{N}$
inv2: $t1 \in PROCESS \pfun \mathbb{N}$
inv3: $t2 \in PROCESS \pfun \mathbb{N}$
inv4: $finite(wait)$
inv5: $t3 \in PROCESS \pfun \mathbb{N}$
inv6: $\forall t, p \cdot (p \in wait \land p \in dom(t1) \land t = t1(p)) \Rightarrow clk - t \leq ddl1$
deadline(t1,t2,ddl1)
inv8: $\forall p \cdot (p \in dom(t1) \land p \in dom(t2) \land t2(p) \geq t1(p)) \Rightarrow t2(p) - t1(p) \leq ddl1$
inv13: $\forall t, p \cdot (p \in process \land p \in dom(t1) \land t = t1(p)) \Rightarrow clk - t \leq ddl3$
deadline(t1,t3,ddl3)
inv14: $\forall p \cdot (p \in dom(t1) \land p \in dom(t3) \land t3(p) \geq t1(p)) \Rightarrow t3(p) - t1(p) \leq ddl3$
inv10: $\forall p \cdot p \in dom(t1) \Rightarrow 0 \leq t1(p) \land t1(p) \leq clk$
inv11: $\forall p \cdot p \in dom(t2) \Rightarrow 0 \leq t2(p) \land t2(p) \leq clk$
inv12: $\forall p \cdot p \in dom(t3) \Rightarrow 0 \leq t3(p) \land t3(p) \leq clk$
inv15: $\forall t, p \cdot (p \in process \land p \in dom(t1) \land t = t1(p)) \Rightarrow p \in dom(t2) \land t2(p) \geq t1(p)$

EVENTS

Initialisation ⟨extended⟩
begin
act1: $wait := \varnothing$
act2: $process := \varnothing$
act3: $clk := 0$
act4: $t1 := \varnothing$
act5: $t2 := \varnothing$
act6: $t3 := \varnothing$
end

Event wish ⟨ordinary⟩ $\widehat{=}$
extends wish
any
pro
where
grd1: $pro \in PROCESS \setminus wait$
grd2: $pro \in PROCESS \setminus process$
then
act1: $wait := wait \cup \{pro\}$
act2: $t1(pro) := clk$
end

Event enter ⟨ordinary⟩ $\widehat{=}$
extends enter
any
pro
where
grd1: $pro \in wait$
grd2: $card(process) = 0$
then

act1: $wait := wait \setminus \{pro\}$
act2: $process := process \cup \{pro\}$
act3: $t2(pro) := clk$

end

Event leave ⟨ordinary⟩ $\widehat{=}$

extends leave

any

pro

where

grd1: $pro \in process$

then

act1: $process := process \setminus \{pro\}$
act3: $t3(pro) := clk$

end

Event tick ⟨ordinary⟩ $\widehat{=}$

when

grd2: $\forall t, p \cdot (p \in wait \land p \in dom(t1) \land t = t1(p)) \Rightarrow clk + 1 - t \leq ddl1$
grd3: $\forall t, p \cdot (p \in process \land p \in dom(t1) \land t = t1(p)) \Rightarrow clk + 1 - t \leq ddl3$

then

act1: $clk := clk + 1$

end

END