RECYCLINGPLANT SHARED RESOURCE

CADT Recycling_Plant
OPERATIONS
ACTION Notify_weight: $\mathbb{N}$ *[i]*
ACTION Increment_weight: $\mathbb{N}$ *[i]*
ACTION Notify_Drop: *Void*
ACTION Prepare_Replacement:
ACTION Notify_Replacement: $\mathbb{N}$ *[i]*
PROTOCOLS: *Crane* : *Notify_Weight*; *Increment_Weight*; *Notify_Drop*
Container : *Prepare_Replacement*; *Notify_Replacement*
CONCURRENCY: *Crane* | *Container*
SEMANTICS
DOMAIN:
TYPE: $Recycling\_Plant = (weight : \mathbb{N} \times state : State \times accessing : \mathbb{N})$
$State = READY \mid TO\_REPLACE \mid REPLACING$
INITIAL: $self.weight = 0 \land self.state = READY \land self.accessing = 0$
INVARIANT: $\forall r \in Recycling\_Plant \bullet r.weight \leq MAX\_W\_CONTAINER \land r.accessing \leq MAX\_CRANES \land MAX\_W\_CONTAINER > 0$
CPRE: $self.state \neq REPLACING$
Notify_weight(w)
POST: $self^{\text{in}}.weight + w > MAX\_W\_CONTEINER \rightarrow self^{\text{out}}.state = TO\_REPLACE \land self^{\text{in}}.weight+p \leq MAX\_W\_CONTEINER \rightarrow self^{\text{out}}.state = READY$

CPRE: $self.weight+w \leq MAX\_W\_CONTEINER \land self.state \neq REPLACING$
Increment_Weight(w)
POST: $self^{\text{out}}.accessing = self^{\text{in}}.accessing+1 \land self^{\text{out}}.weight = self^{\text{in}}.weight+w$

PRE: $accessing > 0$
CPRE: True
Notify_Drop
POST: $self^{\text{out}}.accessing = self.^{\text{in}}.accessing - 1$

CPRE: $self.state = TO\_REPLACE \land self.accessing = 0$
Prepare_Replacement
POST: $self^{\text{out}}.state = REPLACING$

PRE: $self.state = REPLACING \land self.accesing = 0 \land m > 0$
CPRE: True
Notify_Replacement(m)
POST: $self^{\text{out}}.state = READY \land self^{\text{out}}.weight = 0 \land MAX\_W\_CONTAINER =$

m