
RECYCLINGPLANT SHARED RESOURCE

CADT Recycling_Plant

OPERATIONS

ACTION Notify_weight: $\mathbb{N}[i]$

ACTION Increment_weight: $\mathbb{N}[i]$

ACTION Notify_Drop:

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* | *TO_REPLACE* | *REPLACING*

INI-

TIAL: *self*.*weight* = 0 \wedge *self*.*state* = *READY* \wedge *self*.*accessing* = 0

INVARIANT: $\forall r \in \text{Recycling_Plant} \bullet r.\text{weight} \leq \text{MAX_W_CONTAINER} \wedge r.\text{accessing} \leq \text{MAX_CRANES} \wedge \text{MAX_W_CONTAINER} > 0$

CPRE: *self*.*state* \neq *REPLACING*

Notify_weight(w)

POST: *self*ⁱⁿ.*weight* + *w* > *MAX_W_CONTEINER* \rightarrow *self*.*state* = *TO_REPLACE* \wedge
*self*ⁱⁿ.*weight* + *p* \leq *MAX_W_CONTEINER* \rightarrow *self*.*state* = *READY*

CPRE: *self*.*weight* + *w* \leq *MAX_W_CONTEINER* \wedge *self*.*state* \neq *REPLACING*

Increment_Weight(w)

POST: *self*.*accessing* = *self*ⁱⁿ.*accessing* + 1 \wedge *self*.*weight* = *self*ⁱⁿ.*weight* + *w*

PRE: *accessing* > 0

CPRE: True

Notify_Drop

POST: *self*.*accessing* = *self*ⁱⁿ.*accessing* - 1

CPRE: *self*.*state* = *TO_REPLACE* \wedge *self*.*accessing* = 0

Prepare_Replacement

POST: *self*.*state* = *REPLACING*

PRE: *self*.*state* = *REPLACING* \wedge *self*.*acesing* = 0 \wedge *m* > 0

CPRE: True

Notify_Replacement(m)

POST: *self*.*state* = *READY* \wedge *self*.*weight* = 0 \wedge *MAX_W_CONTAINER* = *m*