Simcad Tugger and Cart Model

Objects and Containment –

- **Parts**

Carriers and Robots –

- **Cart**
- **Tugger**
    - Carrier is a Tugger – Carrier Type to Pull –
        - Cart
        - Number of Carriers to Pull – In this example only one cart is to be pulled behind a tugger, this will drive the number of carts to hook and release at the Drop Off and Pick Up processes
            - 1

Creating the Objects –

Start Processes –

- **Tugger Start –** This process creates the tugger carrier
    - Define Object Creation Rules – Create Carriers Only –
        - Tugger
        - Check –
            - Stop the process after
            - Enter –
                - 1 Objects/Carrier are created
- **Cart Start –** This process creates the cart carriers
    - Define Object Creation Rules – Create Carriers Only –
        - Cart
        - Check –
            - Stop the process after
            - Enter –
                - 5 Objects/Carrier are created
- **Part Start –** This process creates all of the parts that will be loaded onto the cart
    - Define Object Creation Rules – Create Single Object Type –
        - Parts

Loading Parts into the Cart –

Cart Load Process – This process takes the parts and loads them into the carts

- **Cart Load –**
  - Process Capacity and Buffer –
    - Queue/Buffer Capacity – 10
    - Process Capacity - 3
  - Process/Object/Condition Routing – Object Based Routing –
    - Default Routing –
      - Next Process –
        - Cart Pick Up
  - Carrier Requirement – This sets how many objects each cart can hold and how long it takes to load the cart
    - Insert New Carrier Definition –
      - Object Type – Parts
      - Carrier Required – Cart
      - Carrier Waits – Check
      - Min Load – 3
      - Max Load – 3
      - Load Time – 20
    - Number of Empty Carriers – 3
    - Check –
      - Enable Object Based Carriers (A Single row is applied based on object type)

Tugger picking up loaded carts –

Pick Up Processes – This is where the Tugger will pick up loaded carts

- **Cart Pick Up –**
  - Least Busy/Randomized Routing –
    - Evenly distribute work among processes
    - Ignore –
      - Cart Pick Up
      - Depot
  - Carrier Requirement –
    - Number of Empty Carriers – 6
    - Check – Limit Carrier Release to –
      - Release no more than a maximum number of objects – Max = 0
    - Tugger Control – This allows the Tugger to hook a loaded cart
      - Check –
        - Hook Cart When Loaded – At Least – 0
      - Maximum Carts to Hook – 1

Tugger picking up empty carts –

Pick Up Processes – This is where the Tugger will pick up the empty carts at each location

- **Pick Up (1-3) –**
  - Process/Object/Condition Routing – Object Based Routing –
    - Default Routing –
      - Next Process –
        - Depot
  - Carrier Requirement –
    - Number of Empty Carriers – 2
    - Check – Limit Carrier Release to –
      - Release no more than a maximum number of objects – Max = 0
    - Tugger Control – This allows the Tugger to hook an empty cart
      - Check –
        - Hook Cart When Empty – At Least – 0
      - Maximum Carts to Hook – 1

Tugger dropping off loaded carts –

Drop Off Processes – This is where the Tugger drops off loaded carts to be unloaded

- **Drop Off (1-3) –**
  - Process/Object/Condition Routing – Object Based Routing –
    - Tugger –
      - Next Process –
        - Pick Up (1 – 3)
    - Cart –
      - Next Process –
        - Unload 1
  - Carrier Requirement –
    - Check – Limit Carrier Release to –
      - Release no more than a maximum number of objects – Max = 0
    - Tugger Control – This allows the Tugger to release a loaded cart
      - Check –
        - Release Cart When Loaded – At Most – 0
      - Maximum Carts to Release – 2

Unloaded the loaded cart –

Unload Processes – This is where the parts are unloaded from the carts

- **Unload (1-3) –**
  - Process Capacity and Buffer –
    - Process Capacity - 3
  - Process/Object/Condition Routing –
    - Cart –
      - Next Process –
        - Pick Up 1

Dropping empty cart off to load it again –

Depot Process – This is where the empty carts are dropped off to be reloaded at the depot

- **Depot –**
  - Process/Object/Condition Routing –
    - Default Routing –
      - Next Process –
        - Cart Pick Up
    - Cart –
      - Next Process –
        - Cart load
  - Carrier Requirement – This allows the Tugger to release any carts, loaded or empty
    - Tugger Control –
      - Check –
        - Release Cart When Empty – At Most – 0
        - Release Cart When Loaded – At Most – 0
      - Maximum Carts to Release – 2