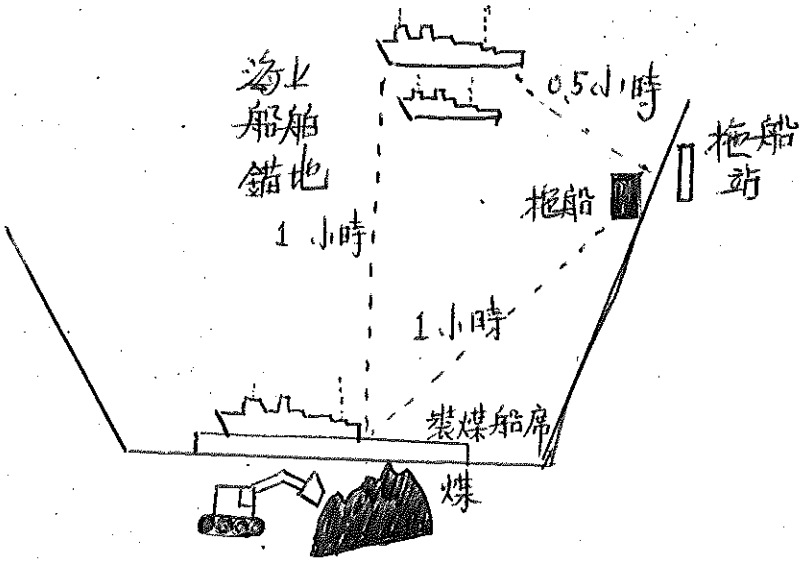
[散裝船席範例]

散裝物資在國貿佔很重要之比例，重要之散裝貨包含鉄礦、水泥、鋁礦、穀類、油、煤等。假設T港是一很小港口僅有一船席與一裝煤机具。船舶進出需受拖船指引。T港概要佈置圖如下圖所示。



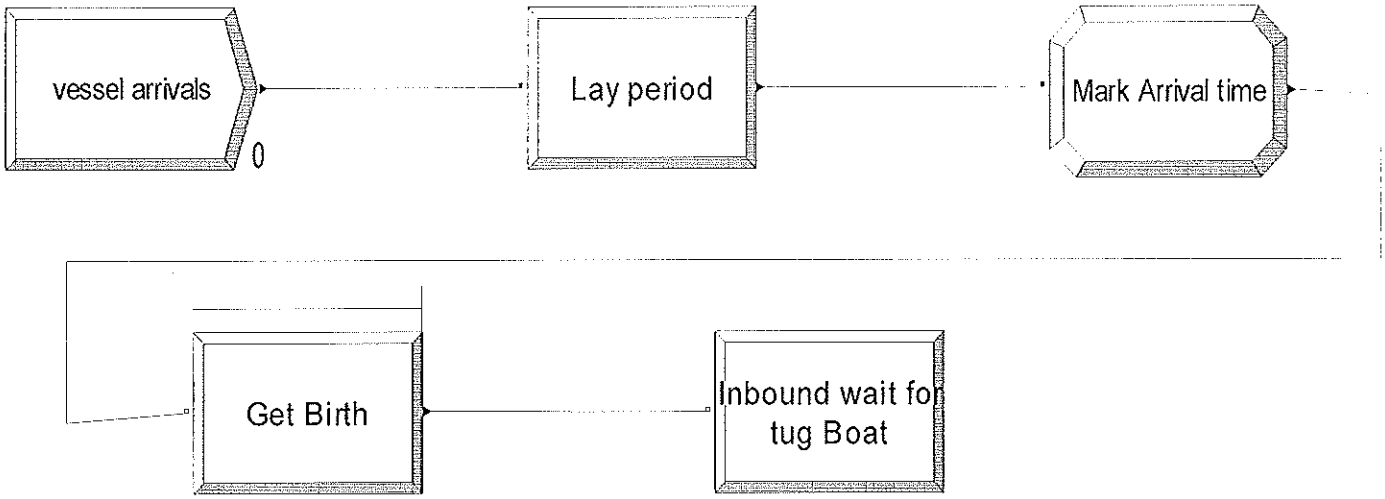
T港全年24小時營運，該港年產煤計劃要求船舶每28小時到達，但由於惡劣天候或其他因素，船舶通常無法準時到達。每船到達停留期間為5天（Lay period），等候原則為FIFO（在錨地等候），當有空船席時立刻由一拖船將等候船舶引導至船席。

拖船停在拖船站，距離錨地30分鐘。由錨地至船席需要1小時。假設煤的生產是連續不斷，船舶的裝煤時間為14~18小時之間。船舶完成裝煤後，拖船將其引領至錨地，船舶將依優先順序離開出港至目的港。

另一項環境因素為潮汐，因會影響船舶可否進出，兩漲潮之間正好相隔12小時，假設船舶可在高(漲)潮中間的4小時進出港，於是12小時中，4小時可進出港，8小時閉閘(無法進出港)。

請模擬丁港1年並估計船席與裝煤机具使用率，每船在港之期望時間。

1. ship arrivals



Create

Name: vessel arrivals

Entity Type: Entity 1

Time Between Arrivals

Type: Constant

Value: 28

Units: Hours

Entities per Arrival: 1

Max Arrivals: Infinite

First Creation: 0.0

OK Cancel Help

Delay

Name: Lay period

Allocation: Other

Delay Time: UNIF(0,24*5)

Units: Hours

OK Cancel Help

Assign

Name: Mark Arrival time

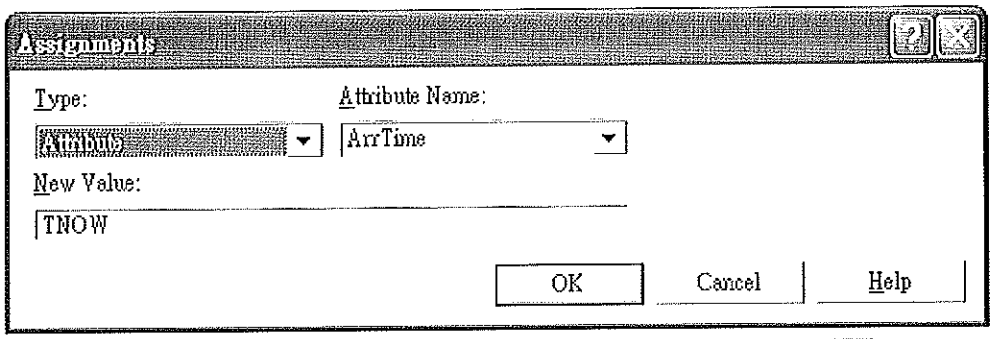
Assignments:

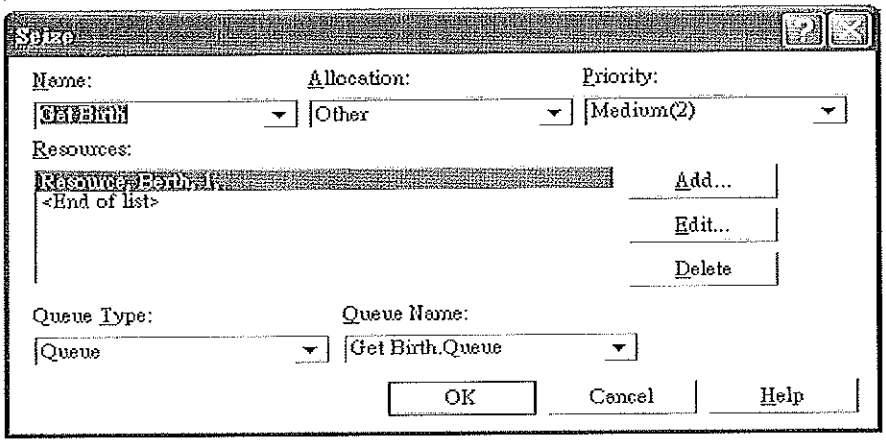
Attribute Assignment: NOW

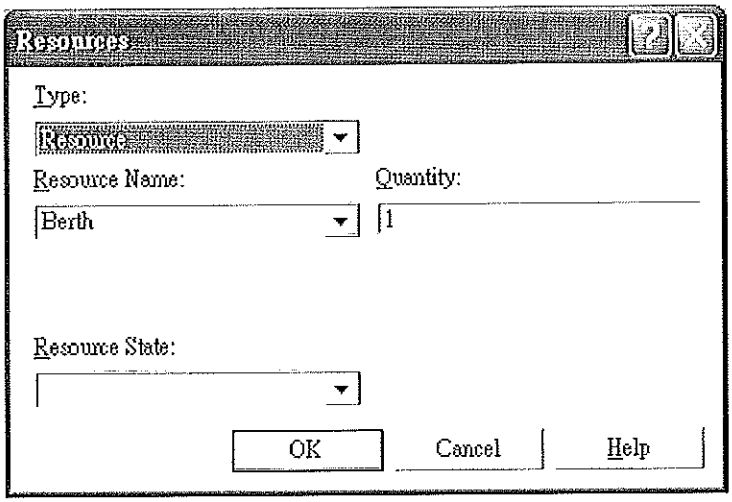
<End of list>

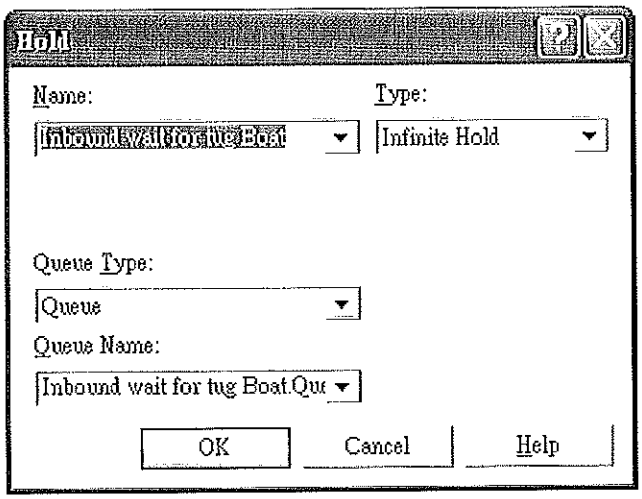
Add... Edit... Delete

OK Cancel Help

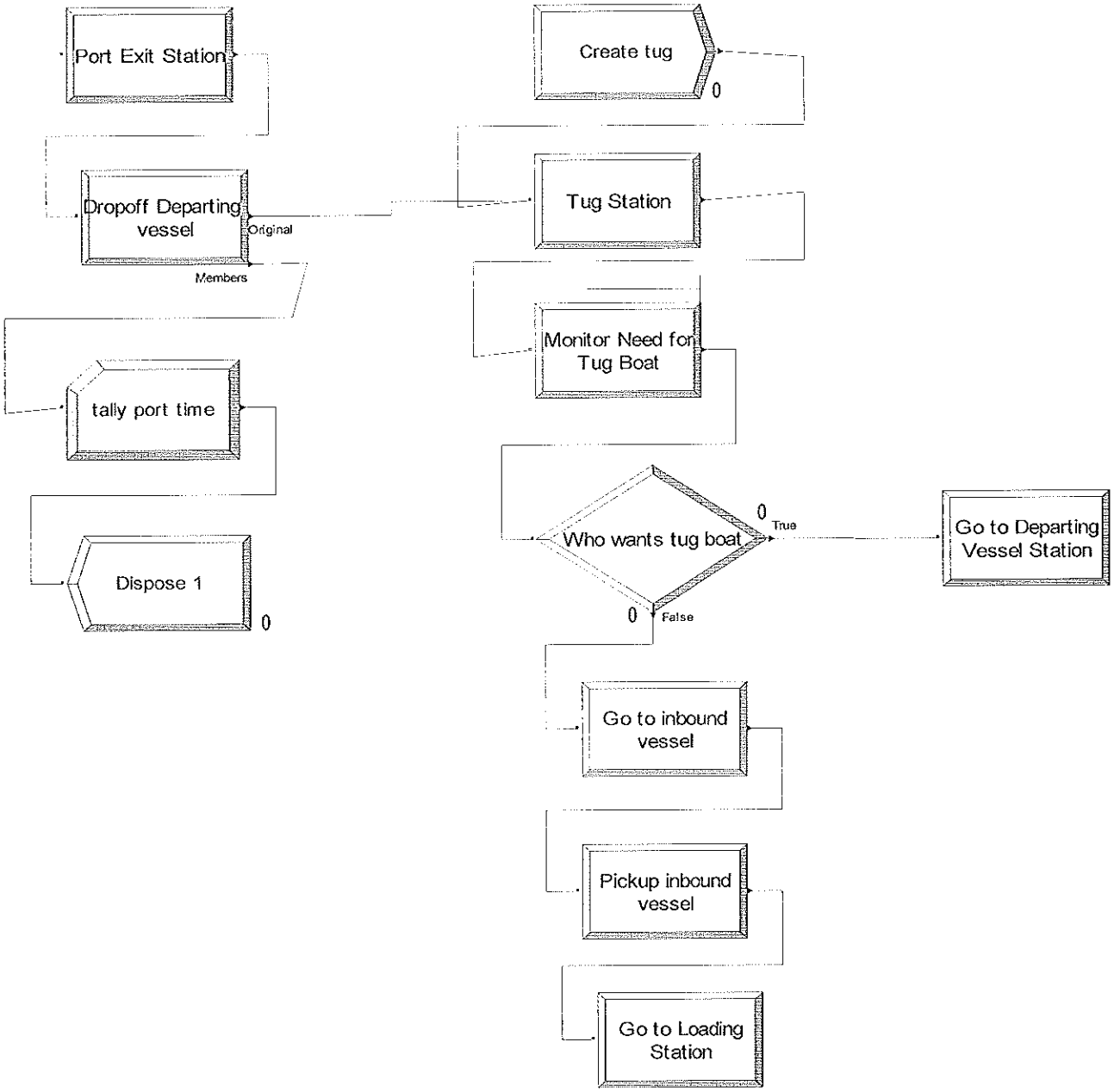

Assignments
Type:
Attribute
Attribute Name:
ArrTime
New Value:
TNOW
OK
Cancel
Help

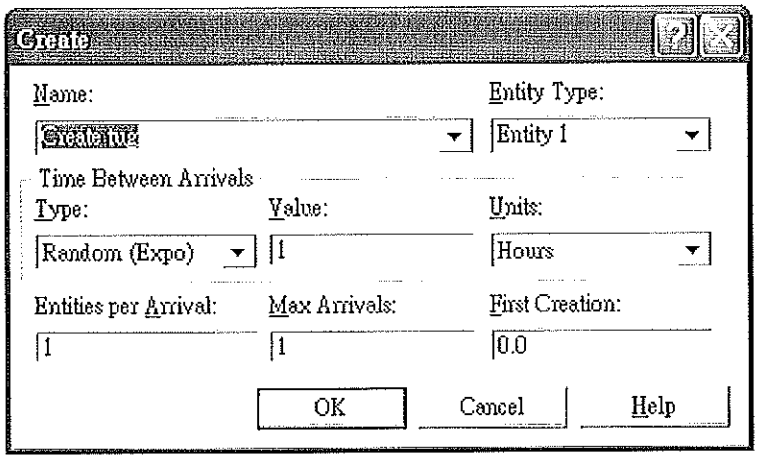

Seize
Name:
Get Birth
Allocation:
Other
Priority:
Medium(2)
Resources:
Resource,Berth,1
<End of list>
Add...
Edit...
Delete
Queue Type:
Queue
Queue Name:
Get Birth.Queue
OK
Cancel
Help

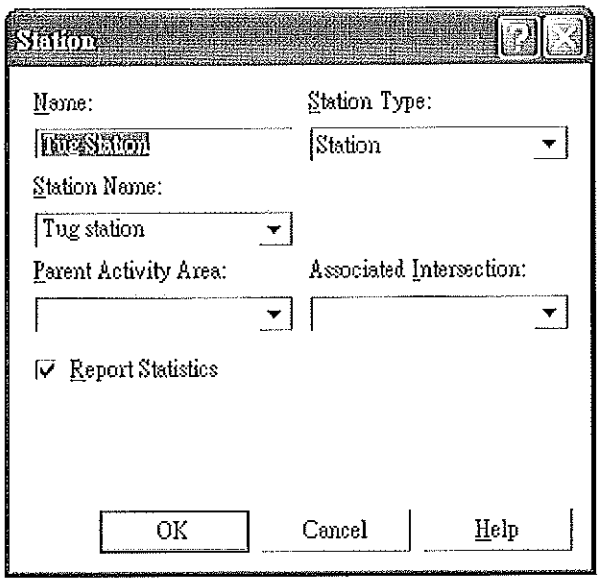

Resources
Type:
Resource
Resource Name:
Berth
Quantity:
1
Resource State:
OK
Cancel
Help

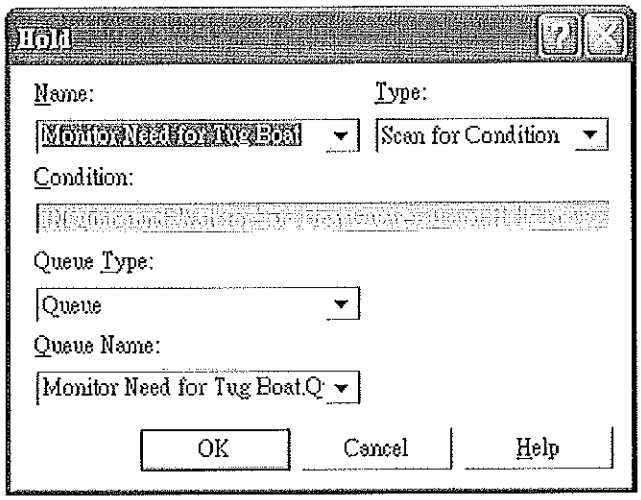

Hold
Name:
Inbound wait for tug Boat
Type:
Infinite Hold
Queue Type:
Queue
Queue Name:
Inbound wait for tug Boat.Que
OK
Cancel
Help

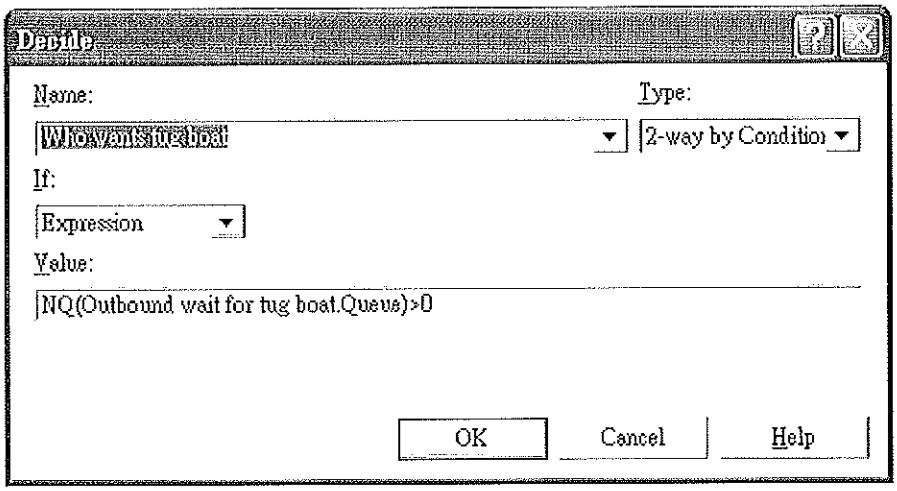
2. Tug Boat operations

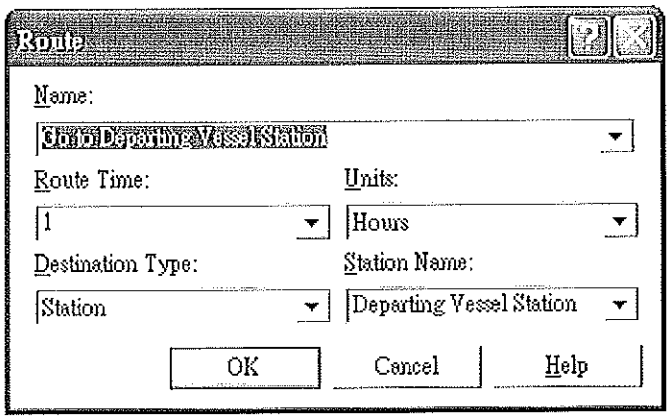


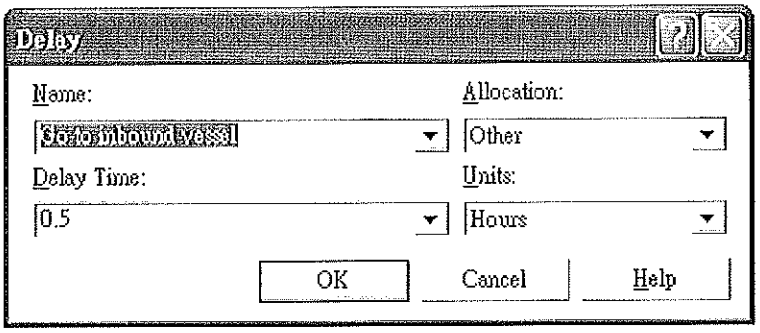


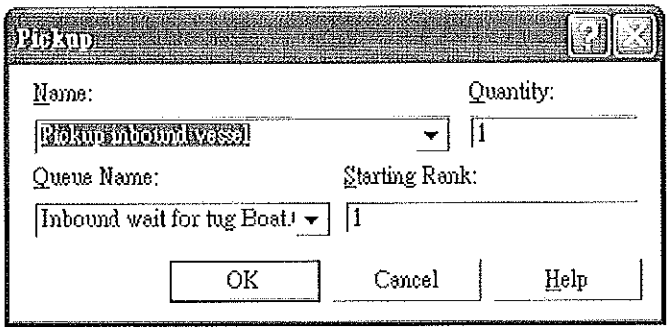

Station
Name:
Tug Station
Station Type:
Station
Station Name:
Tug station
Parent Activity Area:
Associated Intersection:
Report Statistics
OK
Cancel
Help

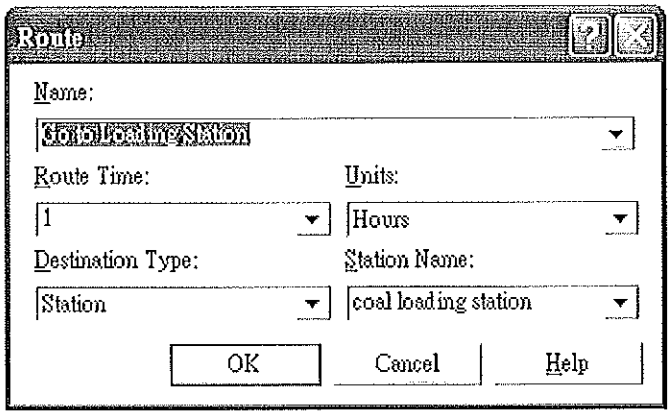

Hold
Name:
Monitor Need for Tug Boat
Type:
Scan for Condition
Condition:
Queue Type:
Queue
Queue Name:
Monitor Need for Tug Boat.Q
OK
Cancel
Help

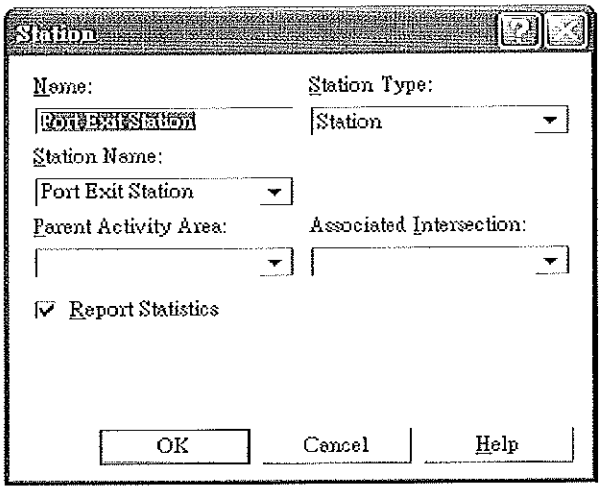

Depth
Name:
Type:
2-way by Condition
If:
Expression
Value:
NQ(Outbound wait for tug boat.Queue)>0
OK
Cancel
Help

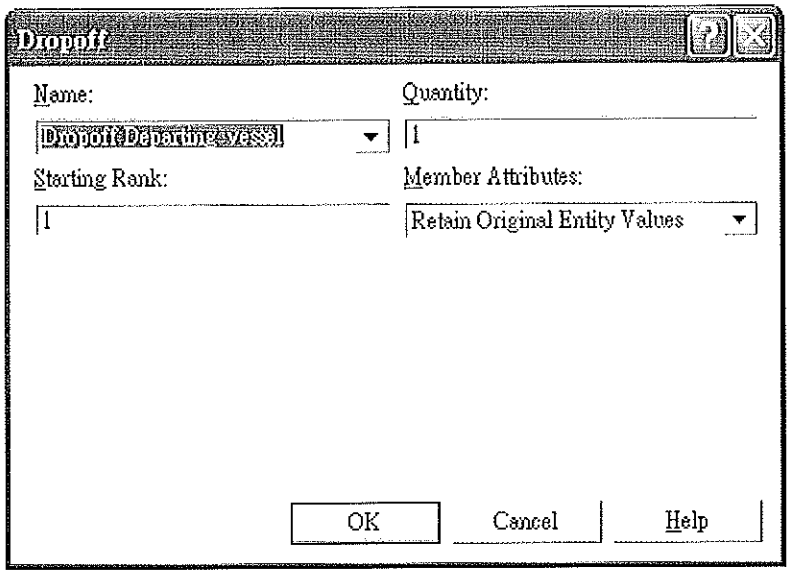

Route
Name:
Route Time:
Units:
1
Hours
Destination Type:
Station Name:
Station
Departing Vessel Station
OK
Cancel
Help

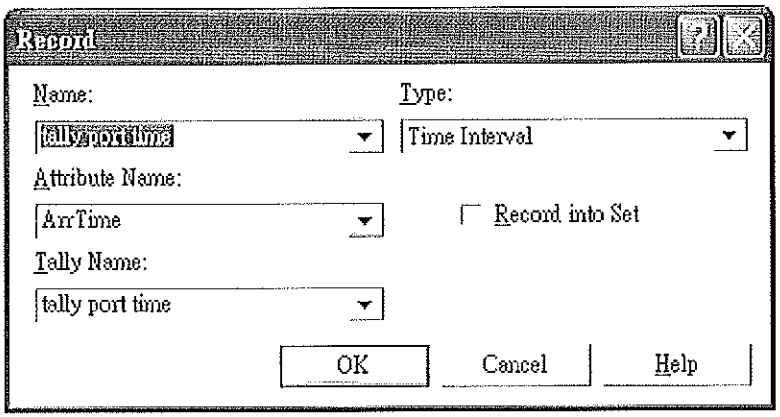

Delay
Name:
Allocation:
Other
Delay Time:
Units:
0.5
Hours
OK
Cancel
Help

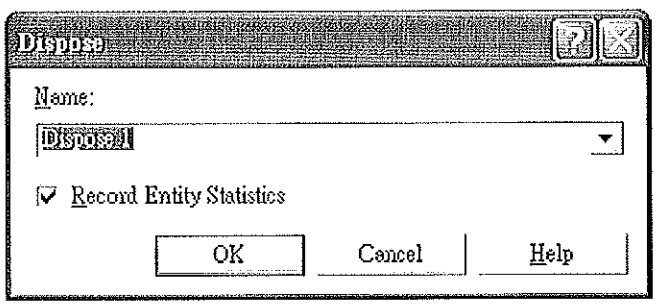

Pickup
Name:
Quantity:
1
Queue Name:
Starting Rank:
Inbound wait for tug Boat
1
OK
Cancel
Help


Route
Name:
Route Time:
Units:
1
Hours
Destination Type:
Station Name:
Station
coal loading station
OK
Cancel
Help

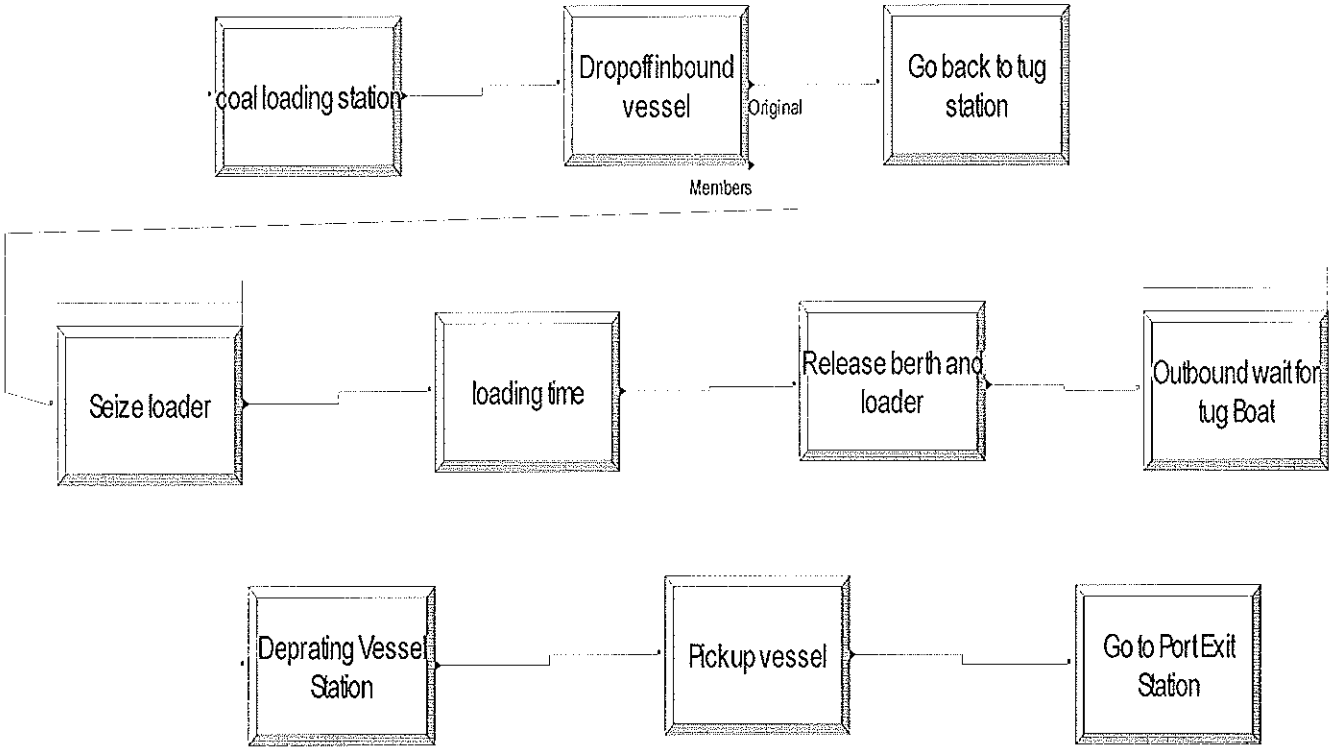

Station
Name:
Port Exit Station
Station Type:
Station
Station Name:
Port Exit Station
Parent Activity Area:
Associated Intersection:
Report Statistics
OK
Cancel
Help

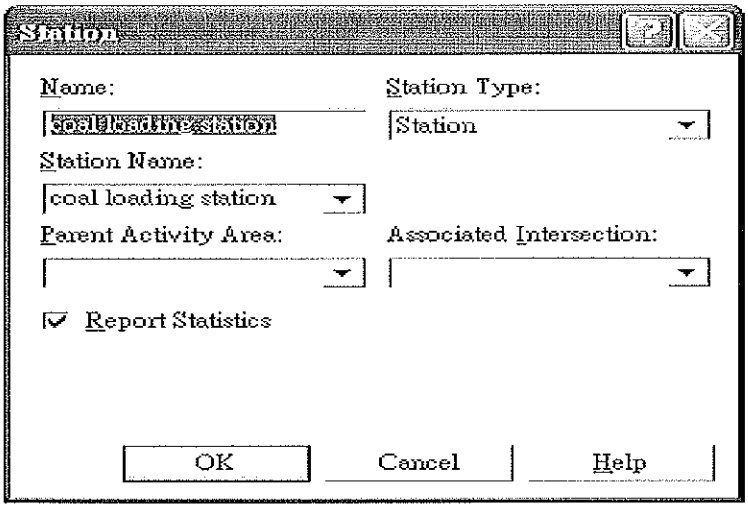

Dropoff
Name:
Dropoff Departure Vessel
Quantity:
1
Starting Rank:
1
Member Attributes:
Retain Original Entity Values
OK
Cancel
Help

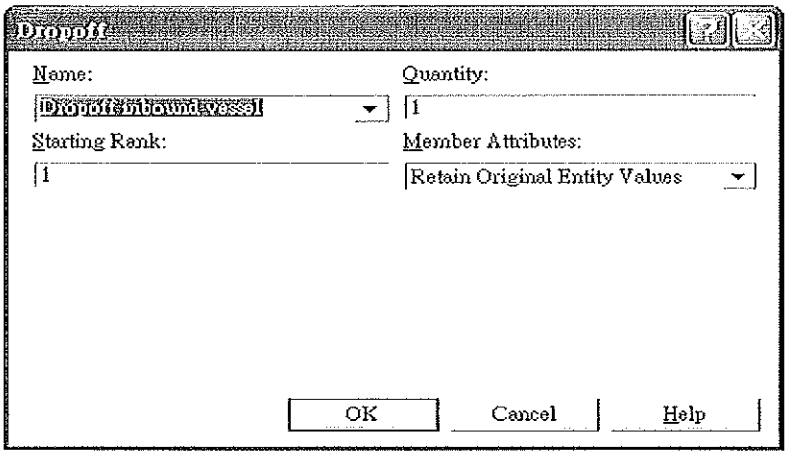

Record
Name:
tally port time
Type:
Time Interval
Attribute Name:
ArrTime
Record into Set
Tally Name:
tally port time
OK
Cancel
Help

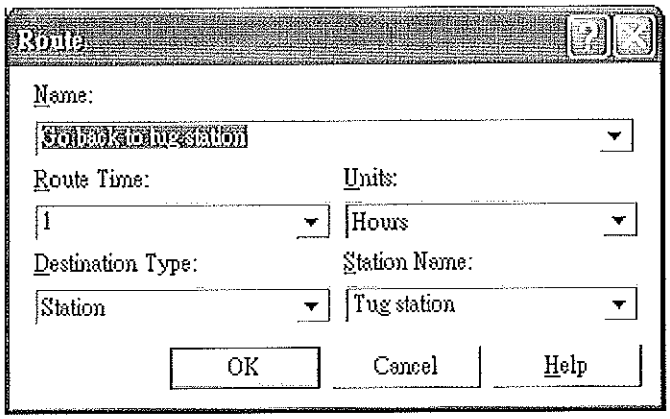

Dispose
Name:
Dispose 1
Record Entity Statistics
OK
Cancel
Help

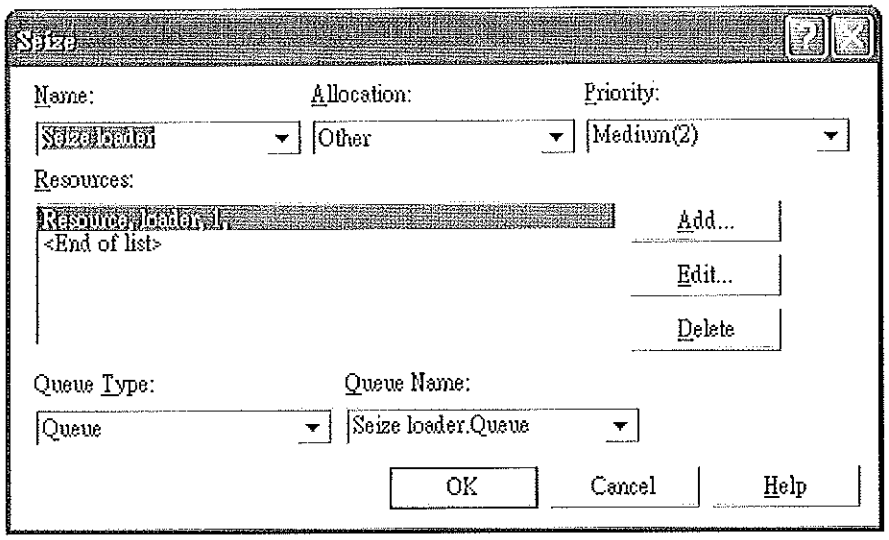
3. Coal-Loading Operations

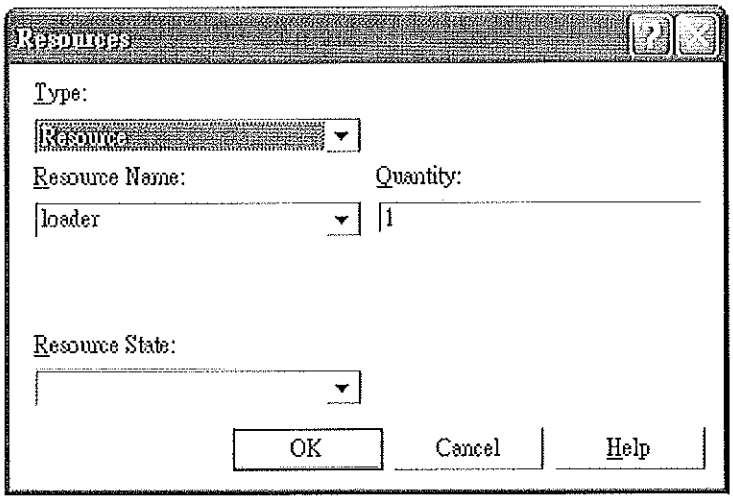


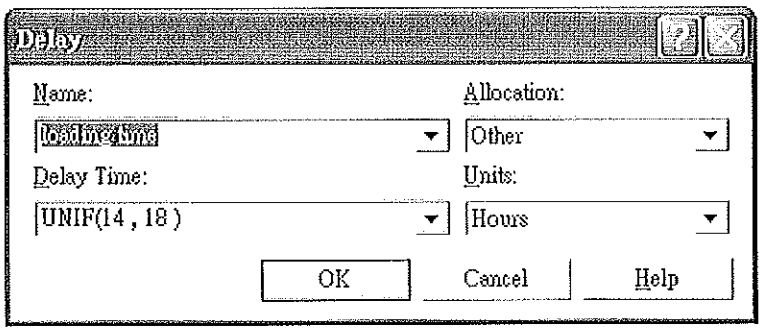


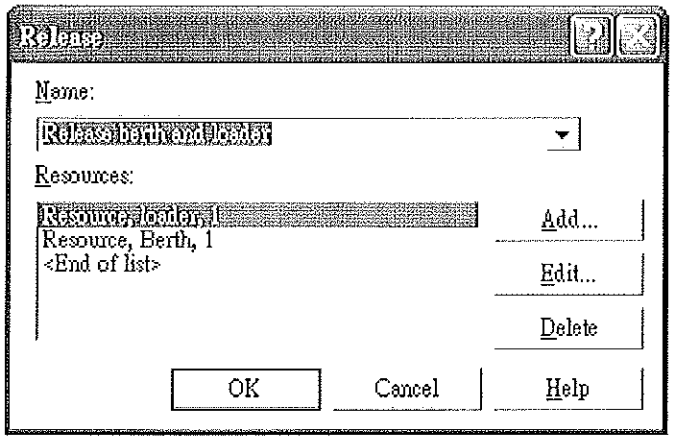


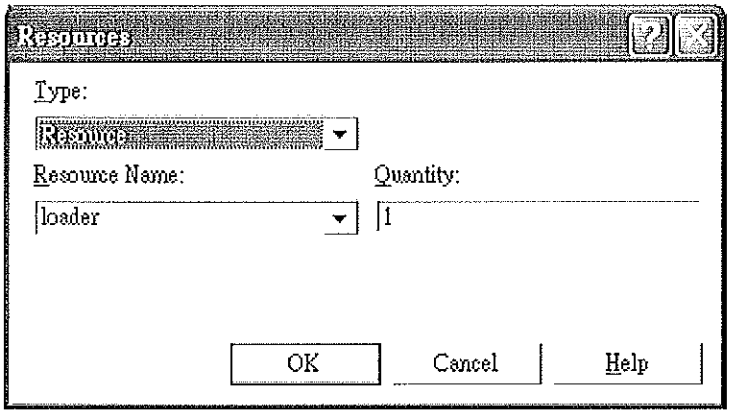

Route
Name:
Go back to tug station
Route Time:
Units:
1
Hours
Destination Type:
Station Name:
Station
Tug station
OK
Cancel
Help

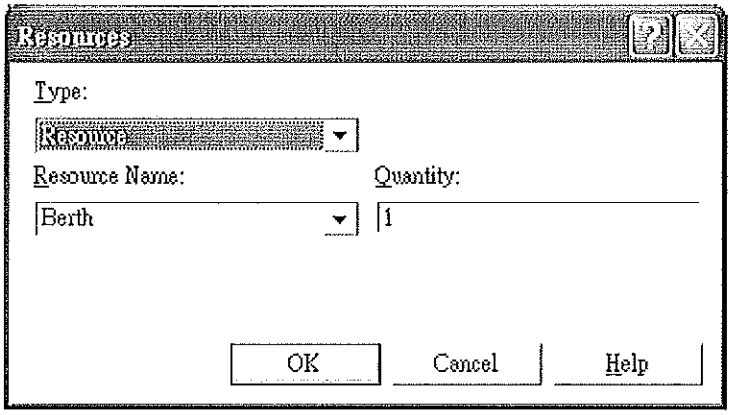

Seize
Name:
Allocation:
Priority:
Seize loader
Other
Medium(2)
Resources:
Resource,loader,1;
<End of list>
Add...
Edit...
Delete
Queue Type:
Queue Name:
Queue
Seize loader.Queue
OK
Cancel
Help

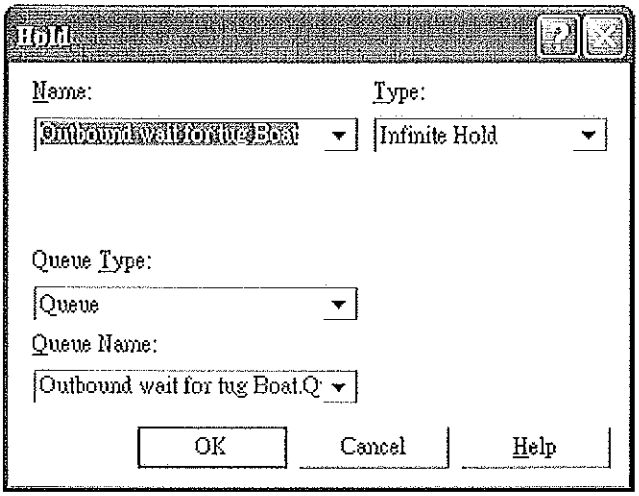

Resources
Type:
Resource
Resource Name:
Quantity:
loader
1
Resource State:
OK
Cancel
Help

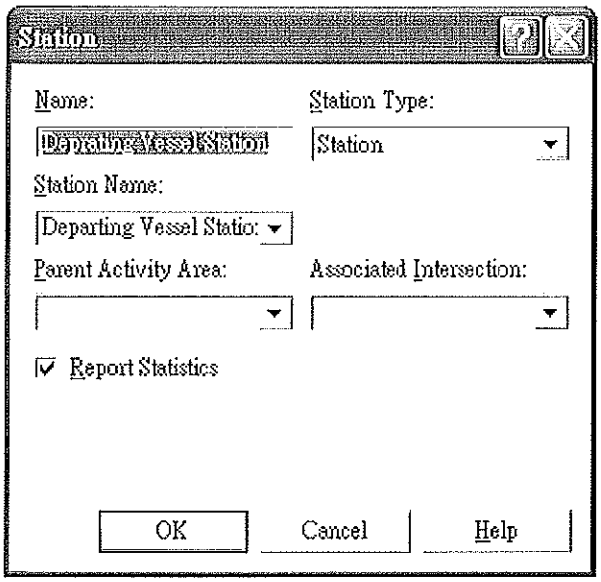

Delay
Name:
Allocation:
loading time
Other
Delay Time:
Units:
UNIF(14 , 18)
Hours
OK
Cancel
Help

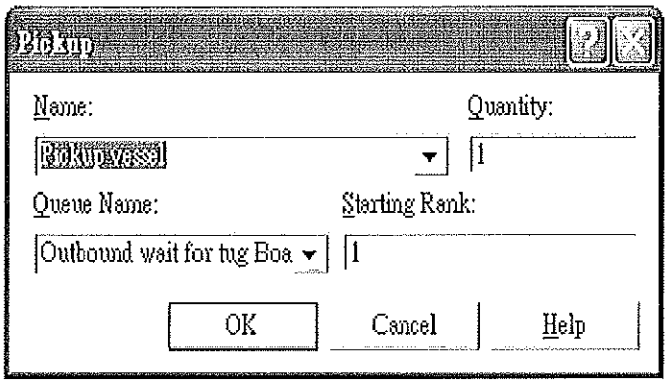

Release
Name:
Release berth and loader
Resources:
Resource, loader, 1
Resource, Berth, 1
<End of list>
Add...
Edit...
Delete
OK
Cancel
Help

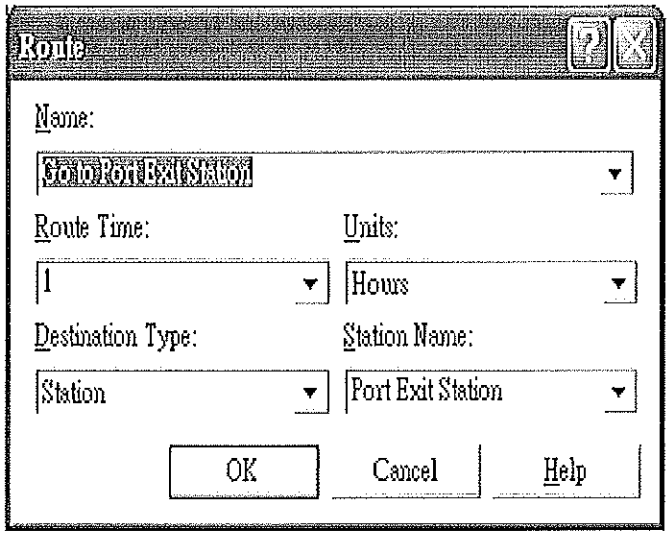

Resources
Type:
Resource
Resource Name:
Quantity:
loader
1
OK
Cancel
Help


Resources
Type:
Resource
Resource Name:
Quantity:
Berth
1
OK
Cancel
Help

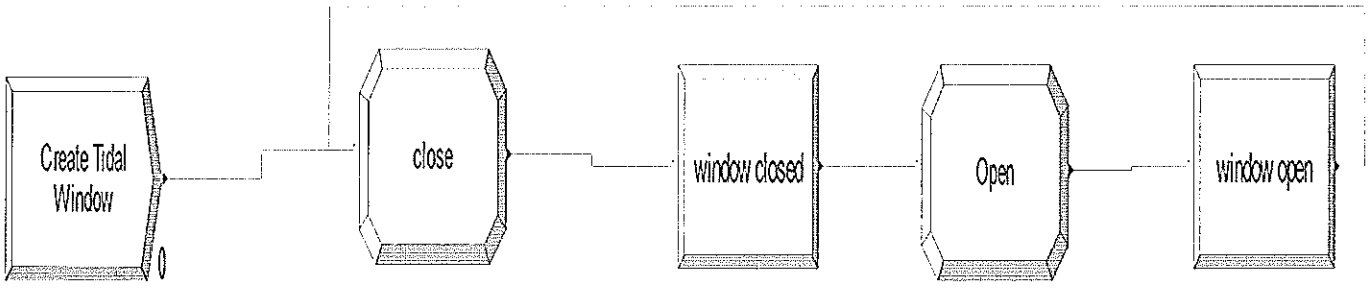

Hold
Name:
Type:
Outbound wait for tug Boat
Infinite Hold
Queue Type:
Queue
Queue Name:
Outbound wait for tug Boat.Q
OK
Cancel
Help

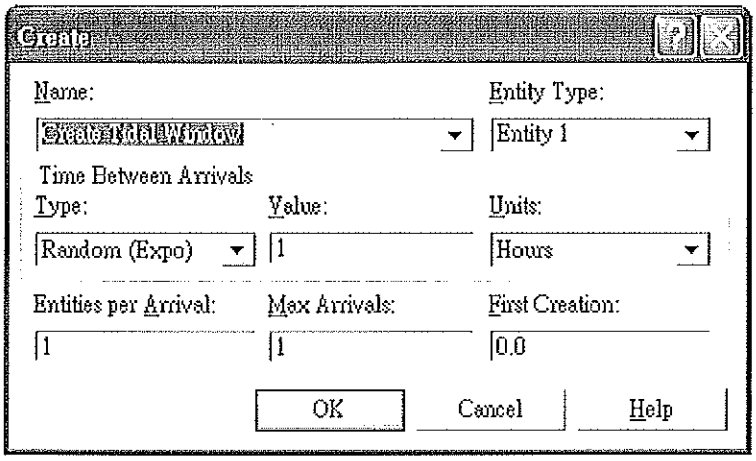

Station
Name:
Departure Vessel Station
Station Type:
Station
Station Name:
Departing Vessel Statio:
Parent Activity Area:
Associated Intersection:
Report Statistics
OK
Cancel
Help

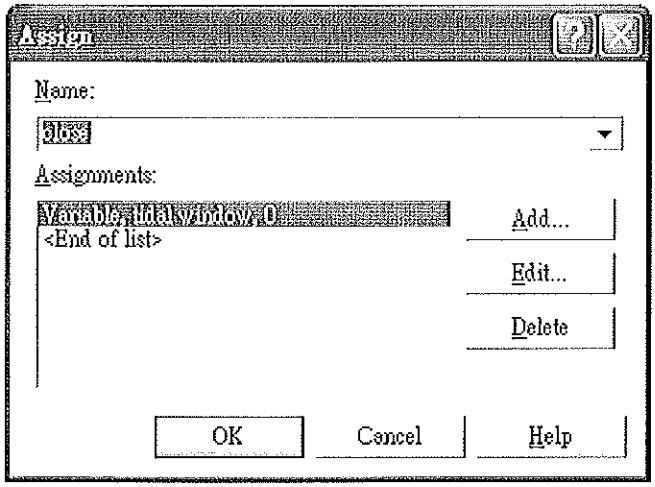

Pickup
Name:
Boat vessel
Quantity:
1
Queue Name:
Outbound wait for tug Boa
Starting Rank:
1
OK
Cancel
Help

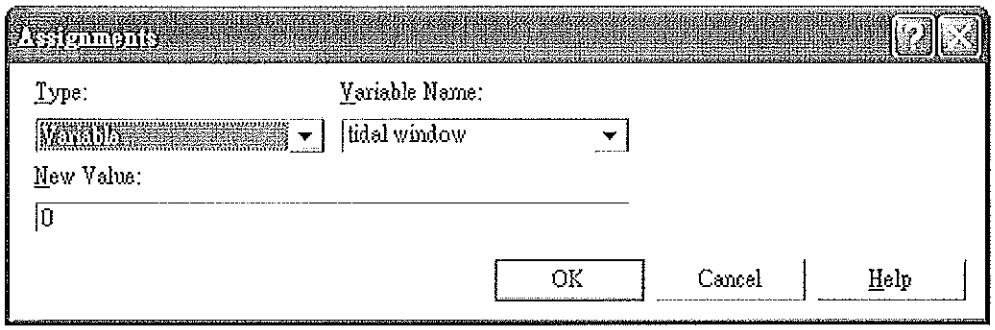

Route
Name:
Route Port Exit Station
Route Time:
Units:
1
Hours
Destination Type:
Station Name:
Station
Port Exit Station
OK
Cancel
Help

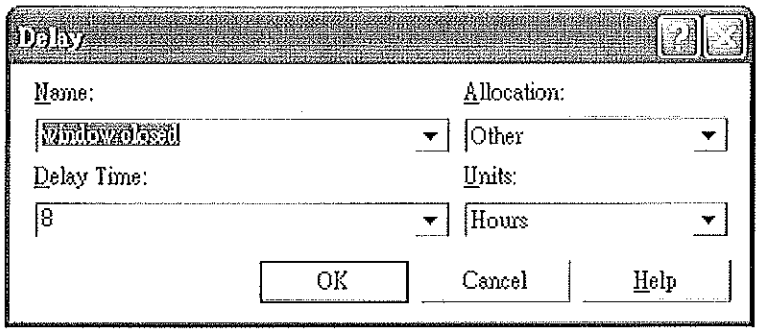
4.Tidal Window Modulation

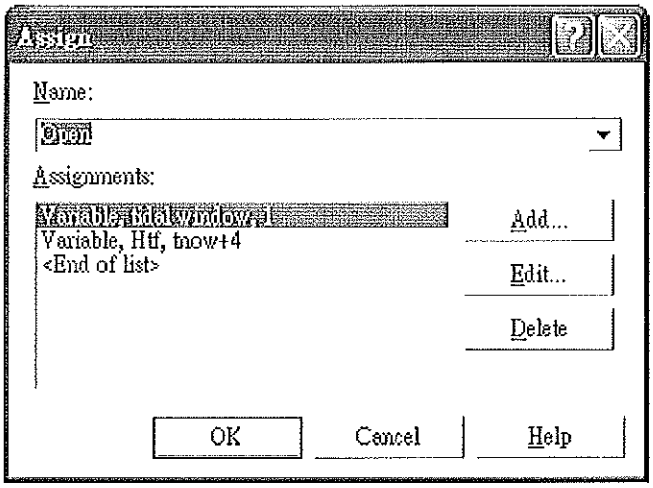


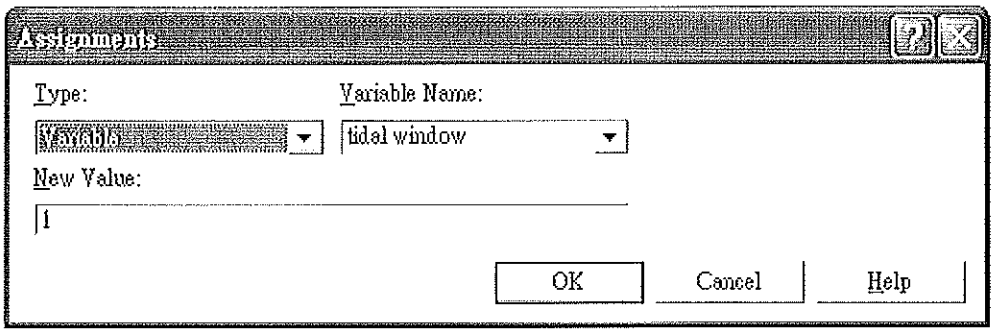


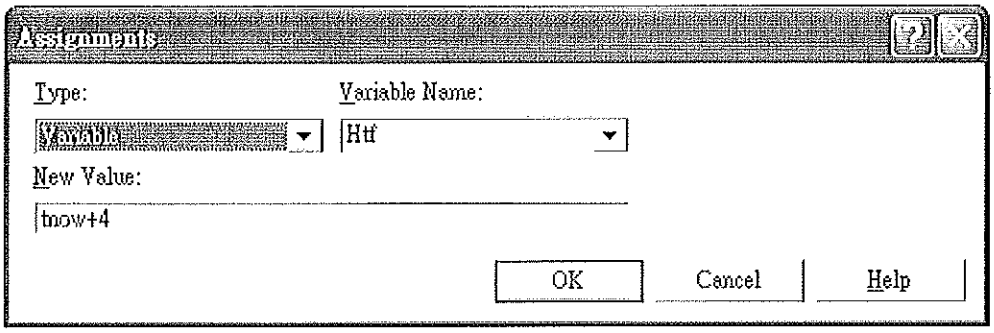


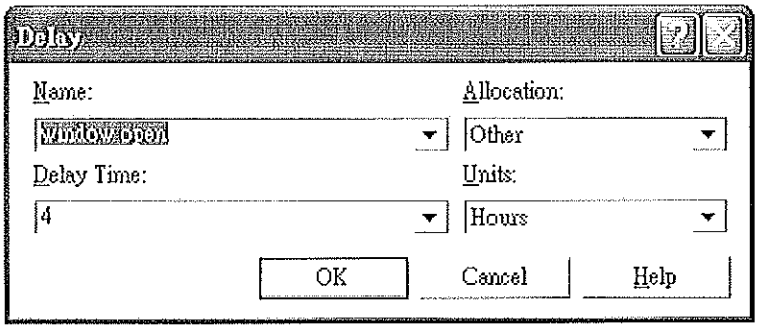



Delay
Name:
Windowclosed
Allocation:
Other
Delay Time:
8
Units:
Hours
OK
Cancel
Help


Assign
Name:
Open
Assignments:
Variable, tidalwindow, 1
Variable, Htf, tnow+4
<End of list>
Add...
Edit...
Delete
OK
Cancel
Help


Assignments
Type:
Variable
Variable Name:
tidal window
New Value:
1
OK
Cancel
Help


Assignments
Type:
Variable
Variable Name:
Htf
New Value:
tnow+4
OK
Cancel
Help


Delay
Name:
Windowopen
Allocation:
Other
Delay Time:
4
Units:
Hours
OK
Cancel
Help