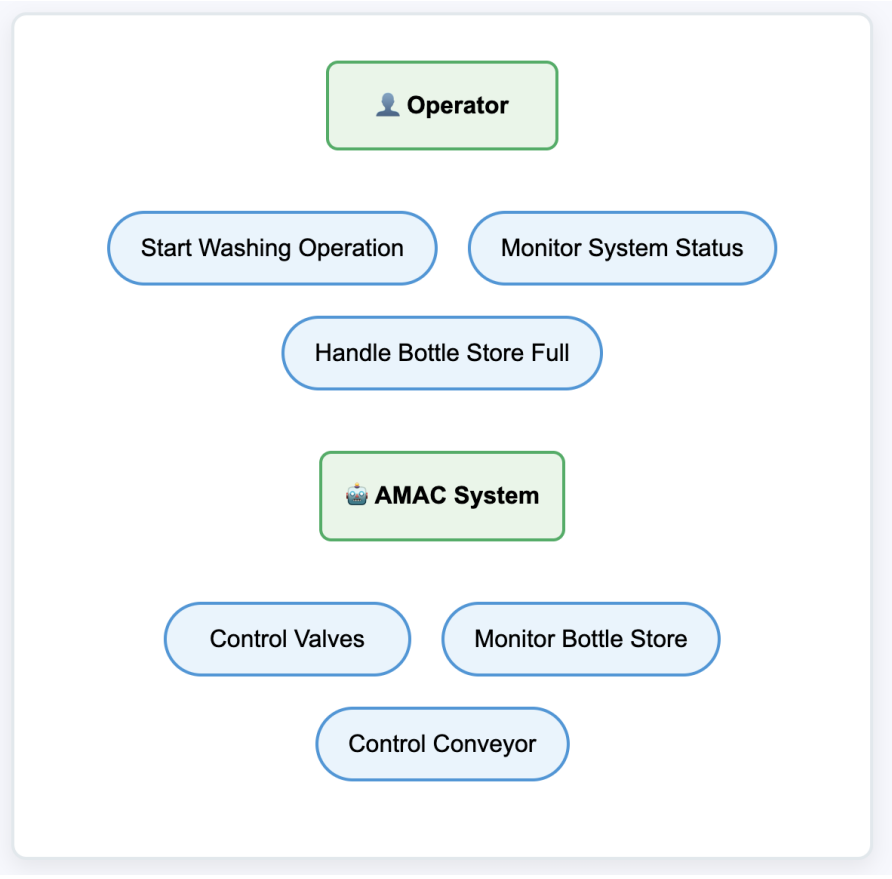
Bottle Washing Plant UML Diagrams

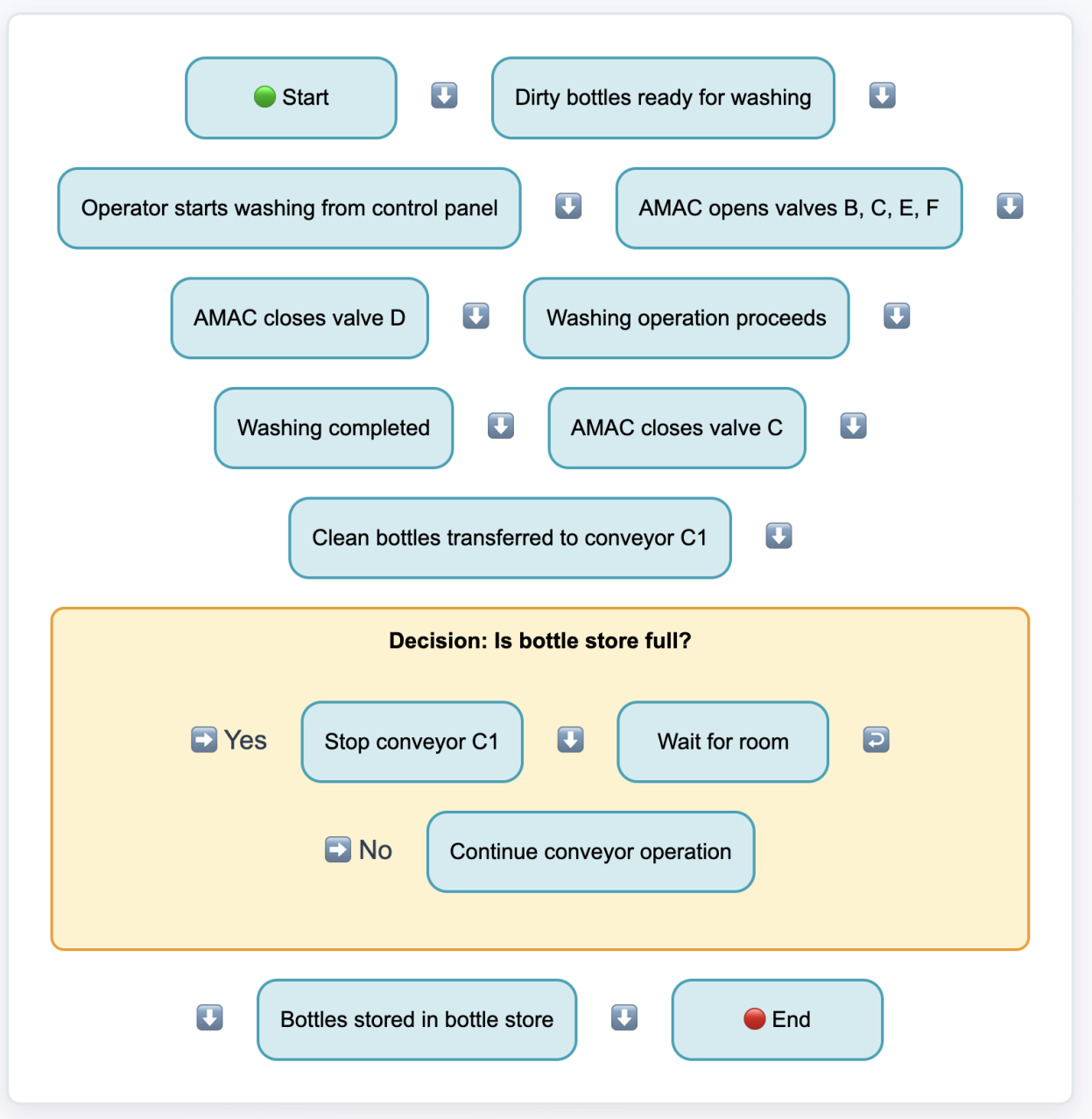
📋 System Assumptions

- AMAC is an automated control system that manages valve operations
- Operators interact with the system through a control panel interface
- The bottle store has capacity monitoring capabilities
- The system provides feedback to operators about operation status
- Sensors monitor bottle store capacity and conveyor status

1. Use Case Diagram



2. Activity Diagram - Washing Operation



3. Class Diagram - Conveyor C1 System

ConveyorC1

Attributes:
- speed: double
- isRunning: boolean
- bottleCapacity: int
- currentLoad: int

Operations:
+ start(): void
+ stop(): void
+ setSpeed(speed: double): void
+ getStatus(): ConveyorStatus

BottleStore

Attributes:
- maxCapacity: int
- currentCapacity: int
- isFull: boolean

Operations:
+ addBottles(count: int): boolean
+ removeBottles(count: int): void
+ checkCapacity(): boolean
+ getAvailableSpace(): int

CapacitySensor

Attributes:
- sensorId: String
- threshold: int
- isActive: boolean

Operations:
+ detectCapacity(): int
+ sendAlert(): void
+ calibrate(): void

ConveyorController

Attributes:
- controllerId: String
- isAutoMode: boolean

Operations:
+ controlConveyor(action: Action): void
+ monitorBottleStore(): void
+ handleCapacityAlert(): void
+ setAutoMode(mode: boolean): void

Relationships:

ConveyorController ←→ ConveyorC1 (controls)

ConveyorController ←→ BottleStore (monitors)

CapacitySensor ←→ BottleStore (measures)

CapacitySensor → ConveyorController (alerts)

4. State Diagram - Conveyor C1

State Transitions:

- Idle → Running: bottles ready for transport
- Running → Stopped: bottle store capacity full
- Stopped → Running: sufficient room available
- Running → Idle: batch transport complete
- Any State → Error: system malfunction (not shown)

5. Sequence Diagram - Washing Operation

📊 Diagram Summary

These UML diagrams provide a comprehensive view of the Bottle Washing Plant system, covering user interactions, process flow, system architecture, state management, and object communication. The diagrams work together to model both the static structure and dynamic behavior of the automated bottle washing and storage system.