Part 3: Elevator Control System
Normal handling
Use Case 1: Normal handling of an elevator for a Customer
Actor: Passenger

Scope: The elevator

Level: Use goal

Stakeholders and Interests
Customer: To use an elevator to move from one direction to another and to ensure the normal handling use is as expected
Elevator: To transport a passenger from one location to another
Precondition: Elevator is setup and ready for passenger use
Success guarantees: Elevator performs as expected (normal handling) for a customer when in use
Main success scenario:
i Passenger presses a button to call an elevator to transport him/her
ii Passenger boards elevator by selecting a destination floor using a panel of buttons
iii Passengers overrides the default timing of doors, causing the door to remain open
iv Passengers uses the help button to request for building safety service
v Elevator sensors notifies passengers when it arrives at a floor

vi Display and audio system shows the current floor number and warning messages
vii Passenger exits the elevator

Main success scenario (Extension):
ia Passengers mistakenly presses the down button but wants to go to a higher floor
iia The panel of buttons in the elevator is not working for passenger desired floor
iiia Another passenger tells current passenge to hold the elevator, but current passenger presses close door
iva Help button is not working
va Elevator sensors light is dim, so passenger can't see the floor number
via Display and audio system showing just floor number and no warning message

Exception handling use

Use Case 1: Passenge presses the help button

Actor: Passenge

Scope: Help button

Level: User goal

Stakeholders and Interests:
Passenger: to be able to receive necessary assistance once the help button is pressed
Precondition: Elevator as help button configured
Success guarantees: Help button sends "Help" alarm signal to voice control signal

Main success scenario
i Passenge presses help button
ii The control system receives a "Help" alarm signal
iii Passenge is connected to building safety service through a voice connector
iv 911 emergency call is placed if there is no response from building safety or passenge

Main success scenario (Extension)
iia The control system does not receive a "Help" alarm signal
iiia The voice connector in the elevator is not working
iva Response is gotten from passenge. Therefore, no 911 emergency call is placed

Use Case 2: Light sensor is interrupted when door is closing

Actor: Passenger

Scope: Elevator door

Level: User goal

Stakeholders and Interests

i Passenger: to interrupt light sensor when door is closing

Precondition: none

Success guarantees: the light sensor is interrupted when door is closing

Main success scenario

i Passenger interrupts light sensor when door is closing

ii Control system stops the door from closing and opens it

iii If the light sensor is repeatedly interrupted, a warning is sounded over the audio system and text message is received

Use case 3: Control system receives a "Fire" alarm signal

Actor: The building

Slope: The elevator

Level: User goal

Stakeholders and Interests

i The building: to send the fire alarm signal to the control system.

Precondition: Fire alarm signal is sent to control system

Success guarantees: Elevators move to a safe floor when fire alarm signal is sent

Main success scenario

i The control system receives a fire alarm signal from the building

ii All elevators are commanded to move to a safe floor

iii An audio and text message are presented to passengers informing them of an emergency and asking them to disembark once they reach the safe floor

Main success scenario (Extension):

ia The building fails to send the fire alarm signal to the control system

iia Elevators lock down with passengers in it

iiia Audio and text message is sent informing passengers to be on standby while the fire service men arrive

Use case 4: Overload alarm signal

Actors: Elevator control system

Scope: The elevator

Level: User goal

Stakeholders and Interests
The elevator: to send the overload alarm signal to the control system
Precondition: none

Success guarantees: The overload alarm signal is sent if the sensors indicate the passenger or cargo load exceeds the carrying capacity

Main success Scenario:
i The control system receives a "Fire" alarm signal from an elevator if the sensors indicate that the passenger or carrying load exceeds the carrying capacity
ii The elevator does not move an audio
iii Text messages are presented to passengers asking for the load to be reduced before attempting to move again

Main success scenario (Extension):
ia The passenger, or carrying load does not exceed the carrying capacity. therefore, no fire alarm signal is sent
iia The elevator moves an audio
iiia Text messages are not presented to passengers

Use Case 5: Power Out Alarm Signal

Actors: The elevator control system

Scope: The elevator

Level: User goal

Stakeholders and Interests
The building: to ensure the elevator power out alarm signal works

Precondition: None

Success guarantees: The elevator sends a power out alarm signal to the control center

Main Success Scenario:
i. The control system receives a "Power out" alarm signal
ii. An audio and a text message are presented to passengers informing them of the power outage
iii. Each elevator is moved to a safe floor
iv. Passengers are asked to disembark via audio and text message
v. All the tasks above are done by the battery backup power

Main Success Scenario Extension

iia. Audio and text message are not presented to passengers

iii a informing them of a power outage
The battery backup power is dead, therefore the elevator cannot be moved to a safe floor
iv a No audio and text message is sent