MARS ROVER MISSION
- CRC SESSION -

EXCERPTS FROM REQUIREMENTS DOCUMENT:

[...]
The Rover is a six-wheeled autonomous robot equipped with:

- An imaging sensor that provides it with information about the terrain in its close proximity
- A digital camera for taking high resolution pictures
- Two redundant sets of meteorological sensors for measuring: pressure, temperature, wind speed and wind direction
- A UHF radio transceiver to communicate with Earth

The Rover will be in radio contact through the UHF Transceiver with Mission Control (MC) at NASA, and will receive commands from human operators [...] A human operator can issue one of the several commands:

- Move to a relative coordinate set – when the Rover receives this command, it attempts to reach that set of coordinates on its own, climbing and going around obstacles. The terrain where the Rover will operate is made up of adjacent hexagons of flat terrain, much like a honeycomb. Each hexagon has a certain relative height to the one occupied by the Rover. See picture 1. The robot can move from one hexagon to an adjacent one if the relative height is less than 5 cm. If the height difference is larger, the Rover may tip over. The Imaging Sensor is capable of seeing only the six adjacent hexagons to the one occupied by the Rover. Each movement from one hexagon to another will be logged and sent back to MC, upon arrival at the specified coordinates. [...] While moving, the Rover will automatically take pictures after every 30 cm or after every turn and store them until it reaches its destination. Then it sends them back to Mission Control. If for some reason, the Rover is stuck and cannot find a way to its final destination, it stops and send a warning to Mission Control together with all the pictures it took.
- Probe sensors – when the Rover receives this command, it measures the values for temperature, pressure, wind speed and direction and sends them back to Mission Control

[...]

Use case: Probe Sensors
Main success scenario:
1. measure temperature, pressure, wind speed, wind direction
2. send measurements to MC

Extensions:
1a: Sensors are broken
.1: send error message back to MC, end use case

Use case: Move to Relative Coordinate Set
Main success scenario:
1. Turn on automatic pictures
2. <u>Determine next hexagon</u>
3. Turn towards chosen hexagon
4. <u>Take picture</u>
5. Log picture
6. Move to next hexagon
7. If not arrived go back to step 2
8. Turn off automatic pictures
9. Send logs and pictures to MC

Extensions:
2a: Rover is stuck
.1: send warning to MC and continue with sep 9