



IRPS
Project Steering Committee Meeting #8
October 27th, 2008
PIAP, Warsaw

MCC Demonstrator Demo



- **Goal of this demonstrator ?**

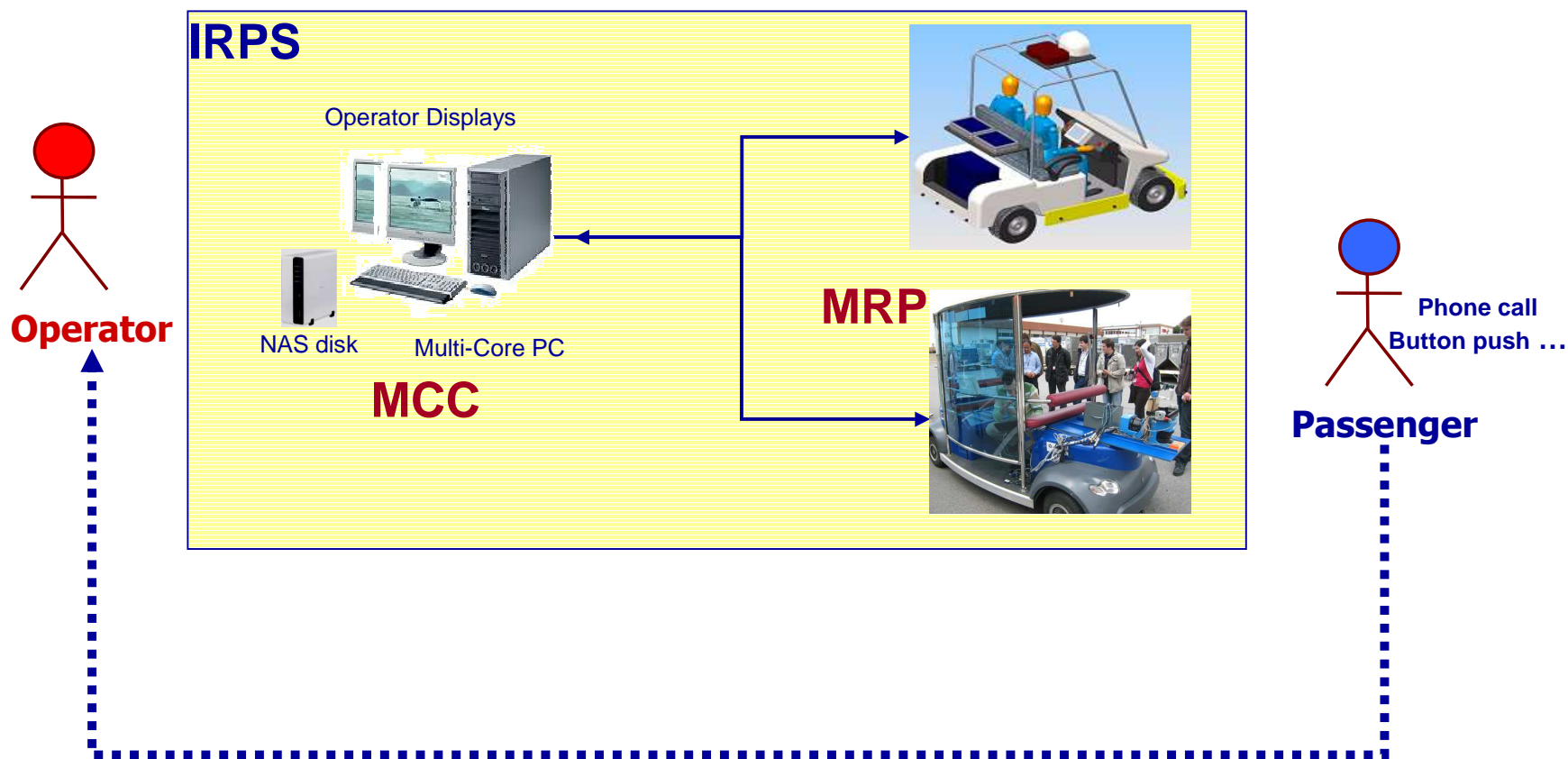
- Provide an IRPS simulator to validate concepts and integration for all partners
- Corba integration
- Progressive integration of modules
 - Integration of MM
 - Integration of 3DV
 - Integration of ILLP
 - Integration of NAV
- Improve MCC GUIs & functionalities

- **Demonstration scenarios**

- Toulouse test Data
- FARO test Data

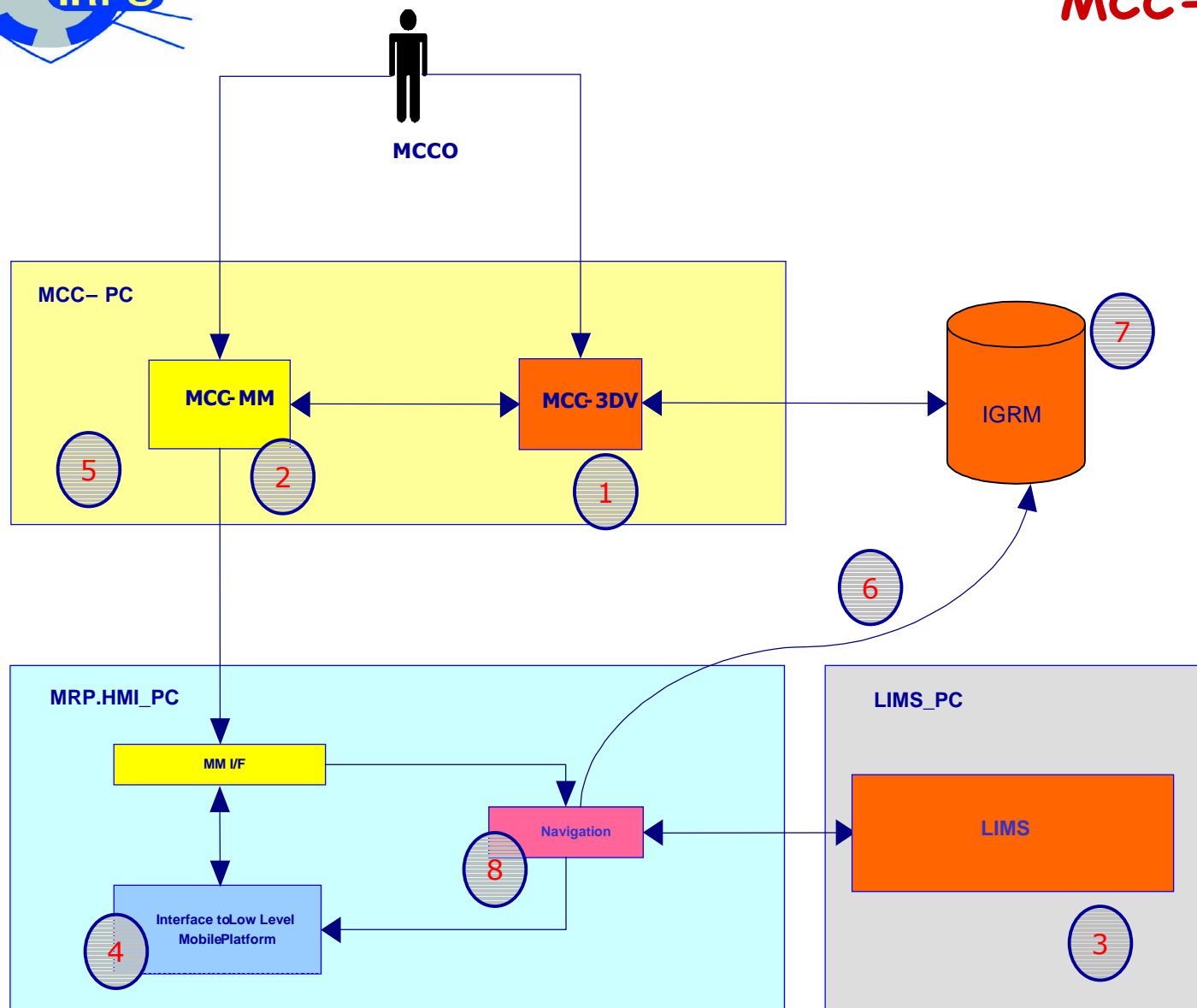


- MCC Operator manages Mobile Robotics Platforms (MRPs)
- help passenger by carrying them & their luggages from one place to another





MCC-Demo Architecture



- **1 - 3D Visualisation**
 - Visualise the environment
 - Define hotspots and paths
- **2 - Mission Manager**
 - Mission planning
 - Start / Stop missions
- **3 - LIMS System**
 - LIMS stub define position
 - NAV sends commands to ILLP
- **4 - ILLP**
 - Receive NAV commands
 - Send status info to MM I/F
- **5 - MCC**
 - Displays status info
- **6 - Change Detection**
 - Detect changes in the environment
 - Send info to IGRM
- **7 - 3DV**
 - Display the detected changes
- **8- NAV**
 - Compute the trajectory of the MRP

■ CS

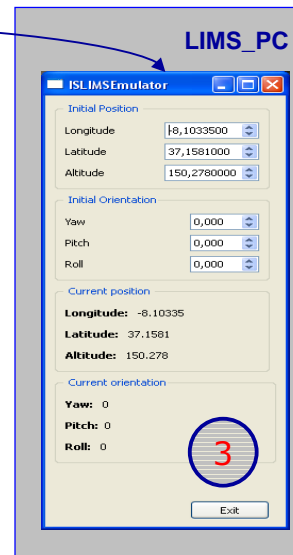
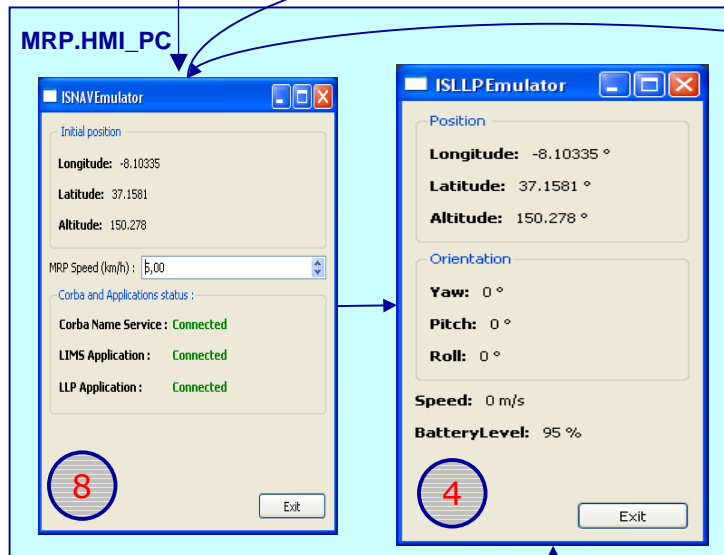
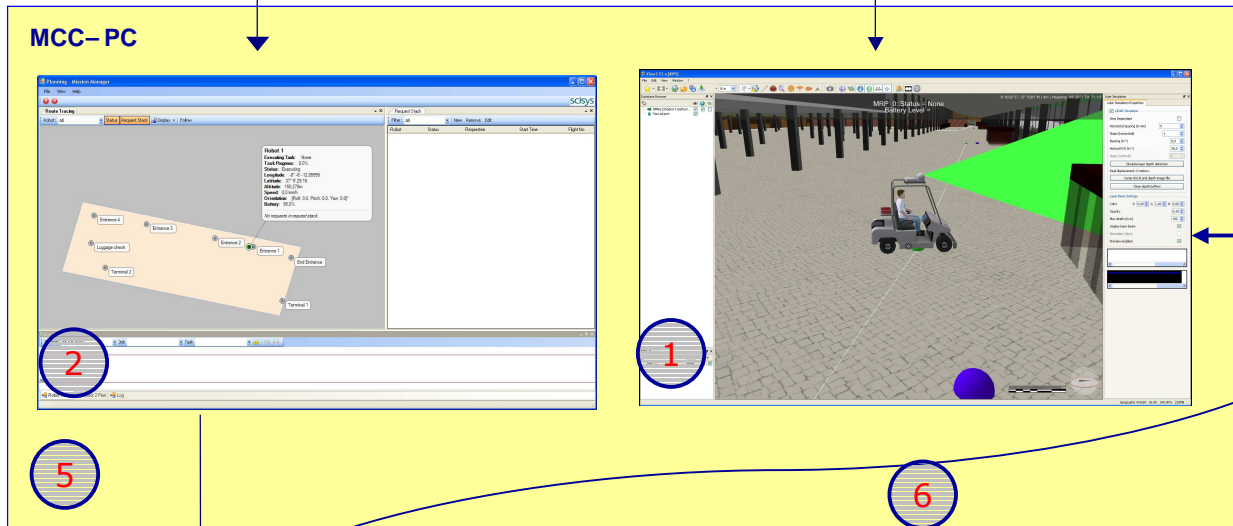
■ PIAP

■ Scisys

■ IIG



MCC-Demo Architecture



- 1 - 3D Visualisation
 - Visualise the environment
 - Define hotspots and paths
- 2 - Mission Manager
 - Mission planning
 - Start / Stop missions
- 3 - LIMS System
 - LIMS stub define position
 - NAV sends commands to ILLP
- 4 - ILLP
 - Receive NAV commands
 - Send status info to MM I/F
- 5 - MCC
 - Displays status info
- 6 - Change Detection
 - Detect changes in the environment
 - Send info to IGRM
- 7 - 3DV
 - Display the detected changes
- 8- NAV
 - Compute the trajectory of the MRP



The screenshot shows the VGeo2 V2.x [IRPS] software interface. The window title is "VGeo2 V2.x [IRPS]" and the menu bar includes "File", "Edit", "View", and "Window". The interface is divided into several panels:

- MRP pool & tools**: Located in the top-left corner, it contains a list of MRP items and associated tools.
- Selected MRP Infos**: Located in the top-center, it displays detailed information for the selected MRP item.
- LIDAR Simulation**: Located in the bottom-left corner, it shows a 2D plot of a LIDAR scan.
- 3D View and Manipulations**: The central area, which displays a 3D wireframe model of a mechanical part. A red arrow points to the model.
- Path Editor**: Located in the bottom-right corner, it provides controls for editing the path of the simulated robot.
- 3D Tools**: A toolbar at the top of the 3D view area, containing various manipulation tools.
- Performance & System infos**: A panel at the bottom of the interface, which displays system performance metrics.



MCC-Demo.3DV

Robot 1::Status = Transport passenger
Battery Level =
Task Progress = 5%

MRPs Browser

ID	Status	A	F
Robot 1	Transport passenger	<input type="checkbox"/>	<input type="checkbox"/>

Lidar Simulation

Lidar Simulation Properties

LIDAR Simulation

View Dependent:

Horizontal Spacing (in mm): 5

Steps (horizontal): 1

Bearing (in °): 0,0

Vertical FOV (in °): 38,0

Steps (vertical): 100

Simulate laser depth detection

Real displacement: 0 meters.

Dump ASCII and depth image file

Clear depth buffers

Laser Beam Settings

Color: R 0,00 G 1,00 B 0,00

Opacity: 0,30

Max depth (in m): 100

Display laser beam:

Normalize Colors:

Preview enabled:

IsPathEditor

IsPathDrawer | IsLocationDrawer

Paths

- Around the Airport

Waypoints

Waypoint Appearance

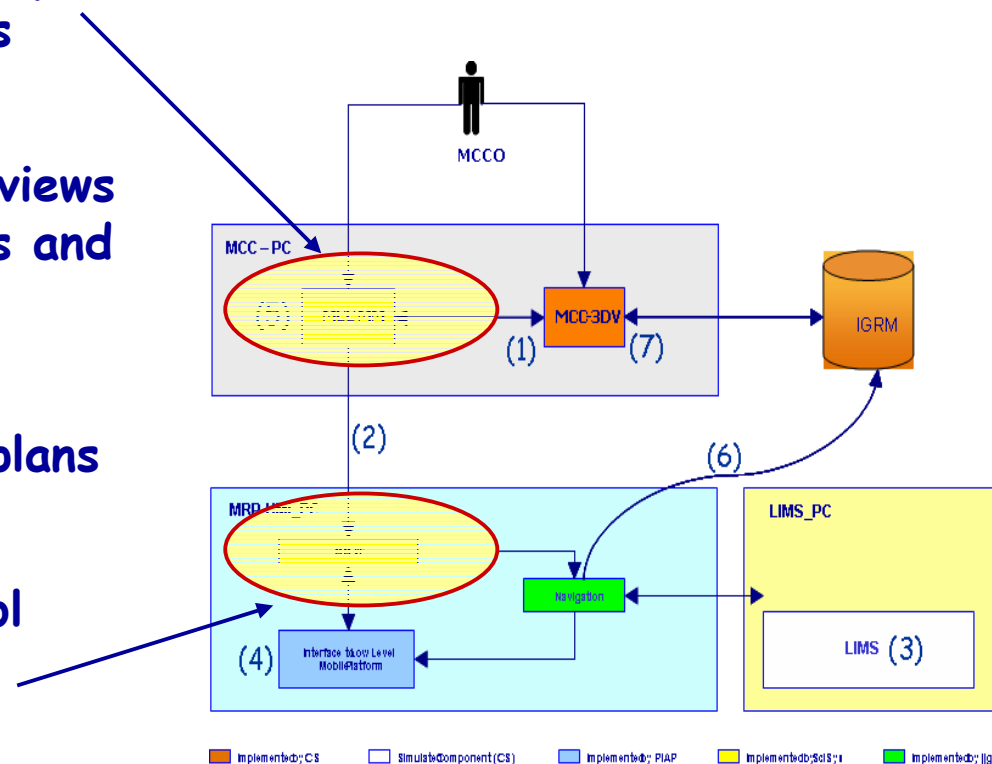
Name	Value
------	-------

Geographic WGS84 : 54.59 | 100.00% | 229MB



MCC-Demo.MM Module

- The Mission Manager (MM) manages a pool of MRPs, collects locations and status from MRPs and allocates plans.
- Operator uses planning or monitoring views to create plans, service user requests and monitor progress of each MRP.
- The MCC-MM Communicates with the MRP-MM on each MRP to distribute plans and query for status.
- The MRP-MM is the high-level control element of the MRP architecture implemented as a Java application





MCC-MM Planning Interface

Configurable Views

The screenshot displays the 'Planning - Mission Manager' application window. It features a menu bar with 'File', 'View', and 'Help'. Below the menu bar are two tabs: 'Route Tracing' and 'Request Stack'. The 'Route Tracing' tab is active, showing a yellow background with a grid and a blue path. A blue box labeled 'Route Planning View' is overlaid on this area. The 'Request Stack' tab is also visible, showing a table with columns for 'Request ID', 'Request Name', 'Request Type', and 'Request Status'. A blue box labeled 'Gantt Plan View' is overlaid on the bottom part of the 'Route Tracing' view. A 'New Transport Request' dialog box is open in the foreground, titled 'New Transport Request' and containing the text 'Create a new transport request.' It has two input fields: 'Current Position to Pickup:' and 'Pickup to Destination:', each with an 'Edit...' button. A 'Display Route' button is located below these fields. At the bottom of the dialog are '< Back', 'Finish', and 'Cancel' buttons. A blue box labeled 'Planning / Request Wizard' is overlaid on the dialog. A blue arrow points from the 'Configurable Views' text to the 'Route Planning View' and 'Gantt Plan View' labels.



MCC-MM Monitoring Interface

Route & Status Monitor

Robot 1
Executing Task: Transport passenger
Status: Executing
Longitude: 1° 22' 28.20989
Latitude: 43° 37' 46.29131
Altitude: 150.35m
Speed: 2.5 km/h
Orientation: [Roll: 0.0, Pitch: 0.0, Yaw: 17.1]°
Battery: 97.3%

Transport from Gate 1 to Gate 3 (14:57)

Status Monitoring

Robot	Executing Sub Plan	Executing Task	Longitude	Latitude	Altitude	Speed	Orientation	Battery
Robot 1	Transport from Gate 1 to Gate 3	Transport passenger	1° 22' 28.20989	43° 37' 46.29131	150.35m	2.5km/h	[Roll: 0.0, Pitch: 0.0, Yaw: 17.1]	97.3%
Robot 2	None	None	1° 22' 28.01999	43° 37' 45.78641	150.35m	0.0km/h	[Roll: 0.0, Pitch: 0.0, Yaw: 295.0]	100.0%

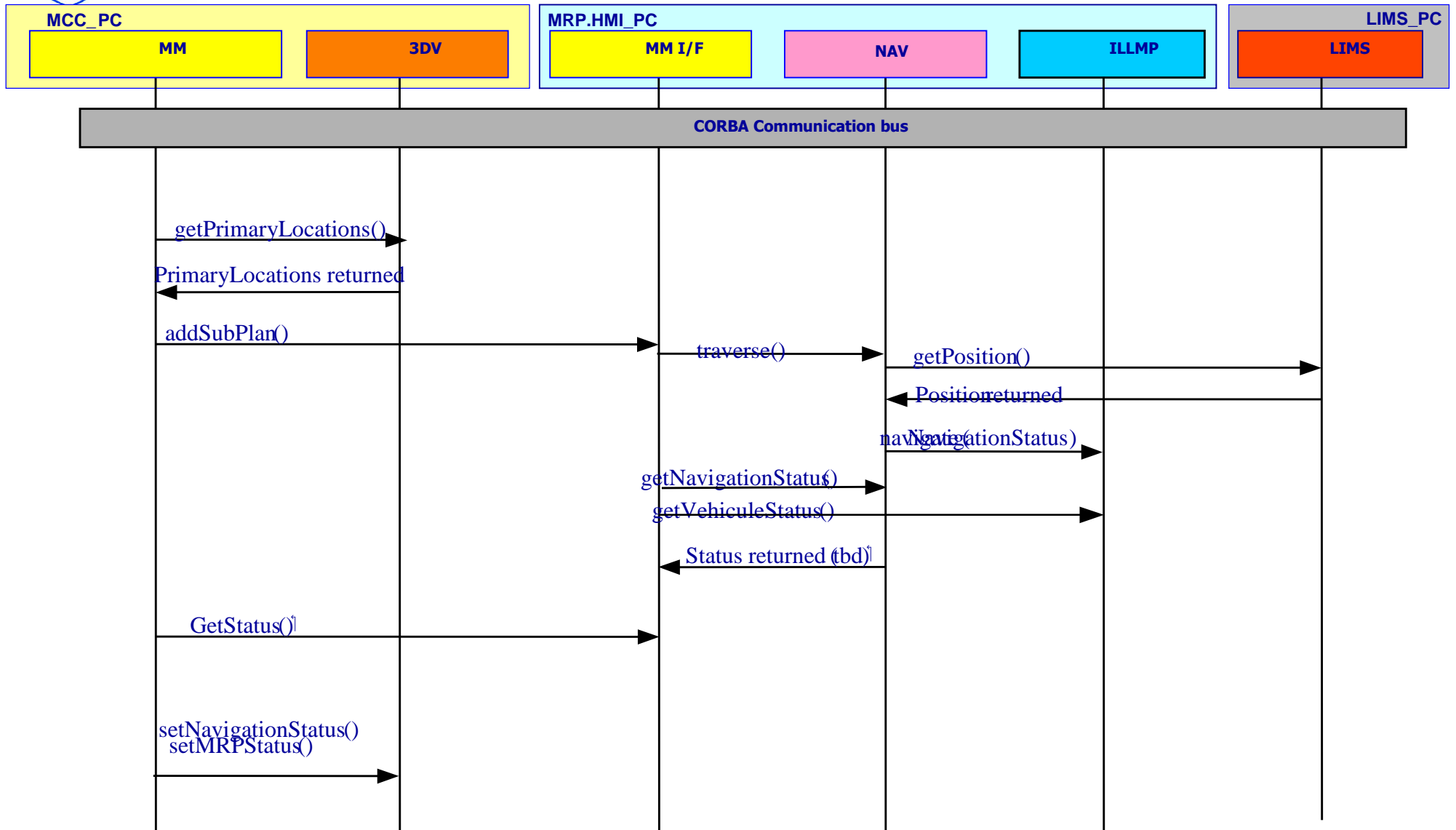
"Soft Stop"

Plan & Log Tabs

Robot 1 Plan
Subplan: All sub plans
Job: []
Task: []
Timeline: 29/01/2008 14:54:00 to 29/01/2008 15:02:00
Log: []



MCC-Demo Sequence Diagrams





MCC-Demo.Change Detection

- **Change Detection**
 - NAV or LIMS sends to IGRM bounding spheres of detected changes
 - 3DV displays the sphere