TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: ENSTA BRETAGNE

Referee I (Sea): VLADI, Referee II (Sea): ANDREA

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 13:00

Duration: 45 min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☒	A1.2 WP2 A ☒	A1.3 WP3 A ☐

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☐
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☐

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☐ A1.6	D2 ☐ A1.7	D3 ☐ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☐
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☐

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☐ A1.15	North-East ☐ A1.16	South-West ☐ A1.17	South-East ☐ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☒ A2.1 Acoustic buoy-2 ☒ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☒
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☐

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☐
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☐
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the <u>first half</u> of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides.	North☐ A2.24	South☐ A2.25	East☐ A2.26	West☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☐ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1☐ A2.30	Area 2☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☐
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☐
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☐
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☒
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☐
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☐ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____

TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: ENSTA TEAM

Referee I (Sea): VLADI, Referee II (Sea): ANDREA

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 15:00

Duration: 45 min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☐	A1.2 WP2 A ☐	A1.3 WP3 A ☐

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☐
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☐

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☐ A1.6	D2 ☐ A1.7	D3 ☐ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☐
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☐

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☐ A1.15	North-East ☐ A1.16	South-West ☐ A1.17	South-East ☐ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☐ A2.1 Acoustic buoy-2 ☐ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☐
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☐

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☐
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☐
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the <u>first half</u> of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides.	North☐ A2.24	South☐ A2.25	East☐ A2.26	West☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☐ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1☐ A2.30	Area 2☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☐
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☐
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☐
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☐
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☐
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☒ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____

TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: U. GIRONA / ISEP INESCTEC

Referee I (Sea): VLADI, Referee II (Sea): ANDREA

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 10:00

Duration: 45 min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☒	A1.2 WP2 A ☒	A1.3 WP3 A ☒

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☐
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☐

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☒ A1.6	D2 ☒ A1.7	D3 ☒ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☒
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☒
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☐

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☒ A1.15	North-East ☒ A1.16	South-West ☒ A1.17	South-East ☒ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☒ A2.1 Acoustic buoy-2 ☒ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☒
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☒

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☒
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☒
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the <u>first half</u> of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides.	North ☒ A2.24	South ☒ A2.25	East ☐ A2.26	West ☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☒ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1 ☐ A2.30	Area 2 ☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☐
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☒
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☒
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☒
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☒
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☐ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____

TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: OUBOT / RAPTORS

Referee I (Sea): RAY, Referee II (Sea): GINNY

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 14:00

Duration: 45 min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☐	A1.2 WP2 A ☐	A1.3 WP3 A ☐

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☒
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☒

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☒ A1.6	D2 ☒ A1.7	D3 ☒ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☒
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☒
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☐

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☐ A1.15	North-East ☐ A1.16	South-West ☐ A1.17	South-East ☐ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☐ A2.1 Acoustic buoy-2 ☐ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☐
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☐

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☐
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☐
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the <u>first half</u> of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides.	North☐ A2.24	South☐ A2.25	East☐ A2.26	West☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☐ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1☐ A2.30	Area 2☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☐
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☐
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☐
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☒
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☒
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☐ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours :

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____

TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: ROBDOS / IIS PIOMBINO

Referee I (Sea): HITESH, Referee II (Sea): KELLY

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 11:00

Duration: 45min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☒	A1.2 WP2 A ☒	A1.3 WP3 A ☒

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☒
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☒

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☒ A1.6	D2 ☒ A1.7	D3 ☒ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☒
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☒
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☒
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☒
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☒

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☐ A1.15	North-East ☐ A1.16	South-West ☐ A1.17	South-East ☐ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☐ A2.1 Acoustic buoy-2 ☐ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☐
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☐

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☐
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☐
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the first half of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides.	North☐ A2.24	South☐ A2.25	East☐ A2.26	West☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☐ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1☐ A2.30	Area 2☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☐
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☐
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☐
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☒
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☒
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☐ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____

TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: TOMKYLE / HSR

Referee I (Sea): YVAN, Referee II (Sea): KELLY

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 16:00

Duration: 45min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☒	A1.2 WP2 A ☒	A1.3 WP3 A ☒

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☒
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☐

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☐ A1.6	D2 ☐ A1.7	D3 ☐ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☐
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☐

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☐ A1.15	North-East ☐ A1.16	South-West ☐ A1.17	South-East ☐ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☒ A2.1 Acoustic buoy-2 ☒ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☒
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☒

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☒
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☒
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the <u>first half</u> of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides. (Acoustic)	North ☒ A2.24	South ☒ A2.25	East ☐ A2.26	West ☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☐ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1 ☒ A2.30	Area 2 ☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☒
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☐
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☒ No
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☒
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☒
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☒ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____

TBM 3: Pipe inspection and search for missing workers (Sea +Air)

Team name: TUSCANY

Referee I (Sea): YVAN, Referee II (Sea): KELLY

Referee I (Air): STJEPAN, Referee II (Air): MARGARIDA

Date (DD/MM/YYYY): 21/09/2017, Time (24:00): 12:00

Duration: 45 min (Max. 45 min) ☐ Timeout

Achievements

Set A1: Outdoors

An **aerial robot** reaches the waypoints (WPs) within a radius of 5 m in **autonomous navigation.** *Waypoints can be reached in no specific order and the team can suggest additional waypoints to their flight plan*	A1.1 WP1 A ☒	A1.2 WP2 A ☒	A1.3 WP3 A ☒

Within 30 minutes of start of the run, a robot reports the correct location (within radius 5 m) of the missing worker outside the building.	A1.4 ☐
An **aerial robot** deploys the first-aid kit (within radius 2 m) from the worker outside the building.	A1.5 ☐

	Pipe damages on land		
The aerial robot(s) reports the damages on the land pipes. *(Each damage can only be scored once).*	D1 ☒ A1.6	D2 ☒ A1.7	D3 ☒ A1.8

The **aerial robot** detects the leak marker on the pipe.	A1.9 ☒
The **aerial robot** reports the pipe that is leaking on land.	A1.10 ☒
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-West side).	A1.11 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (North-East side).	A1.12 ☐
The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-West side).	A1.13 ☐

The **aerial robot** builds an outdoor map of the land pipes area with OPIs (South-East side).	A1.14 ☐

	Maps (by area)			
The **aerial robot** builds the maps **on board** during the flight. The maps must be shown to the referees just after the flight finishes.	North-West ☐ A1.15	North-East ☐ A1.16	South-West ☐ A1.17	South-East ☐ A1.18

Set A2: Underwater

	Type of images	
The **underwater robot** provides images of the gate.	Acoustic buoy-1 ☒ A2.1 Acoustic buoy-2 ☒ A2.2	Optical buoy-1 ☐ A2.3 Optical buoy-2 ☐ A2.4

The **underwater robot** passes through the gate without touching it.	A2.5 ☒
The **underwater robot** passes through the gate within the first 30 minutes from the start of the run.	A2.6 ☒

	Buoys				
The **underwater robot** detects the plume buoys in real time. Images are needed.	B1☐ A2.7	B2☐ A2.8	B3☐ A2.9	B4☐ A2.10	B5☐ A2.11
	Buoys numbers				
The **underwater robot** recognises the number on the plume buoys	B1☐ A2.12	B2☐ A2.13	B3☐ A2.14	B4☐ A2.15	B5☐ A2.16

The **underwater robot** produces a geometric map of the plume (Area: B1+B2).	A2.17 ☒
The **underwater robot** produces a geometric map of the plume (Area: B3+B4+B5).	A2.18 ☐
The **underwater robot** detects the leak marker on the pipe in real time.	A2.19 ☐
The **underwater robot** recognises and provides images of the black number stamped on the leaking pipe.	A2.20 ☐
The **underwater robot** reports which is the number of the leaking pipe by its geometric position.	A2.21 ☐
Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the <u>first half</u> of the leaking pipe.	A2.22 ☐

Following the leaking pipe up to the assembly structure, the **underwater robot** provides an image mosaic of the second half of the leaking pipe.	A2.23 ☐

	Pipe structure sides			
The **underwater robot** provides images of the structure sides.	North☐ A2.24	South☐ A2.25	East☐ A2.26	West☐ A2.27

	Structure Side	
The **underwater robot** provides a 3D reconstruction of the structure.	Front ☐ A2.28	Rear ☐ A2.29

The **underwater robot** provides a 2D acoustic or optical map of the debris.	Area 1☐ A2.30	Area 2☐ A2.31

The **underwater robot** localises the missing worker underwater within a radius of 5 meters.	A2.32 ☐
The **underwater robot** gives the dimensions and geometrical shape of the closest object to the worker.	A2.33 ☐
The **underwater robot** provides 3D reconstruction of the worker.	A2.34 ☐
The **underwater robot** surfaces within a radius of 2 meters from the worker position.	A2.35 ☐

Set A3: Cooperation

The **underwater robot** communicates directly OR through a surface robot to the **aerial robot** the position (within a radius of 5 meters) of the worker underwater. Specify if directly/through surface robot: _____	A3.1 ☐
The **aerial robot** receives and decodes the message with the position of the worker sent by the **underwater/surface robot.**	A3.2 ☐
The **aerial robot**, upon receiving the position of the underwater worker, takes a picture (from the authorised aerial volume) of the harbour area showing either the underwater robot or the surface robot on the position that marks where the worker is. (The image includes location).	A3.3 ☐
The **underwater robot** communicates the correct underwater leaking pipe to the aerial robot.	A3.4 ☐
The **aerial robot** receives and decodes the message with the correct leaking pipe sent by directly by the underwater or through the surface robot.	A3.5 ☐

The **aerial robot** communicates the correct land leaking pipe to the underwater robot (directly or through the surface robot).	A3.6 ☐
The **underwater robot** receives and decodes the message with the correct land leaking pipe sent by the aerial robot or the surface robot.	A3.7 ☐

Set A4: General

The **underwater robot** surfaces in a controlled way once all the tasks have been done.	A4.1 ☒
The **aerial robots** return to the landing area once all the tasks have been done.	A4.2 ☒
The **aerial robot(s)** transmits live position and images/video to the control station during the run.	A4.3 ☒
The **marine robot(s)** transmits live position and images/video to the control station during the run or the manipulation task.	A4.4 ☐

Penalised Behaviours

The robot needs manual intervention during a run (e.g. the robot is stuck):	
Marine robot	No permitted
Aerial robot	PB1 ☐ (max. 1)

The underwater robot changes batteries.	PB2☐ (max. 1)
The underwater robot surfaces at any point (GPS fix can be obtained) and re-submerges. *(The surface for preparation of the manipulation task is not penalised)*	PB3 ☐ ☐ (max. 2)
The aerial robot does not keep the safety distance of 5 m with the building wall.	PB4 ☐ ☐ (max. 2)

Disqualifying Behaviours

A robot damages competition arena (including the obstacles).	DB1 ☐
A robot does not conform to safety requirements for the competition.	DB2 ☐
The aerial robot leaves the flight volumes defined by the organisation.	DB3 ☐
The aerial robot impacts the building.	DB4 ☐
The aerial robot enters the building.	DB5 ☐
A marine robot is tele-operated (except for safety reasons agreed by the Technical Committee and the manipulation task).	DB6 ☐

Comment: _____

WARNING: A disqualifying behaviour discards all other achievements in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

(Time is 60 min after the end of the team's time-slot, formats as described in the TBM-3)

Team leader signature: _____

Referee signature: _____