



Personal Watercraft

Learning outcomes and key teaching points



About Rescue 3 Europe

Rescue 3 Europe develops state of the art technical rescue courses, providing internationally recognised accreditation for organisations and individuals operating in high risk environments.

As an international accrediting body, Rescue 3 provide up to date best practice guidance that is constantly evolving in line with new research and testing. All changes and developments of Rescue 3 courses go through a process of peer review and oversight by a steering committee made up of industry experts from all over the world.

Rescue 3 training providers deliver courses worldwide, in multiple disciplines, including: rope, water, boat, ice and confined space rescue. Our large suite of courses have been adopted by mountain rescue teams, wind turbine operators, fire and rescue services, ambulance teams, utilities providers, and military personnel.

Within each discipline, Rescue 3 accredited courses cover every level of operations, whether this is at an awareness level, avoiding risks and applying simple safe systems of work; or at more advanced levels where practitioners must acquire high levels of personal skills and understanding to access and navigate difficult environments.

For over four decades Rescue 3 has provided the standard for technical rescue training, offering guidance and support for maintaining best practice.





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PWC Foundation (PWC-F)

Course overview and target audience

The PWC Foundation course (PWC-F) is for people who wish to use personal watercraft (jetskis) in flat and sheltered water, eg lakes, estuaries, harbours. Following successful completion of this course, they will be able to handle a PWC in good conditions.

Contact hours 12 hours (2 days)	Prerequisites Minimum age: 18
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- PWC Foundation Instructor (PWCFI)
- Flood Rescue PWC Operator Instructor (FPWCI)
- Swiftwater and Flood Rescue FPWC Operator (SPWCI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- PWC handling
- Flips and rights



PWC Foundation (PWC-F) skill sheet contents

Theory	Practical
1. About Rescue 3	12. Launching and recovery
2. Water hazards	13. PWC handling
3. Personal equipment	14. Securing
4. PWC equipment	15. Personal recovery and self rescue
5. Avoiding and dealing with emergencies	16. Passenger recovery
6. Navigation and route planning	17. Flips and rights
7. Pre- and post-use PWC checks	
8. Collision avoidance	
9. Medical considerations	
10. Communications	
11. PWC hull, engine and drive types	



PWC Foundation (PWC-F) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	About Rescue 3	1.1	Recognise the role of Rescue 3 Europe as an accrediting body.	Rescue 3 as an accrediting body. Designing safety and rescue courses – not just ‘rescue’
		1.2	Recognise the different personal watercraft (PWC) courses available within the Rescue 3 scheme.	Courses for basic PWC handling. Courses for operating and performing rescues in flood, swiftwater and surf environments.
		1.3	Recall the remit and role of people trained to PWC-F level.	This course is designed for basic PWC handling in flat and sheltered water in good conditions. Recertification requirements.
2	Water hazards	2.1	Recall the definitions of basic water, moving water, coastal water, swiftwater and whitewater	Basic water - typically still, flat water, eg lakes, ponds, canals. Moving - flowing down gradient, eg streams, rivers, drainage channels. Coastal water - eg coastal sea, ocean, estuaries. Swiftwater - fast moving, steeper gradient, eg steep rivers, drainage channels, flash flood conditions. Whitewater - fast moving, steeper gradient, used for kayaking, rafting
		2.2	Identify general water hazards, and suitable control measures	Depth, temperature, weather, current flow, wind, tides, rips
		2.3	Identify water hazards in a basic water environment, and suitable control measures	Lake and harbour bed morphology, entrapments, debris
		2.4	Recall additional hazards in a moving water environment	Volume, gradient, undercuts, strainers, siphons, hydraulics, weirs, inspection covers, bridge pillars, entrapments. Operating in swiftwater is beyond the remit of PWC-F.



	Skill sheet element		Learning outcome	Key teaching points
3	Personal equipment	3.1	Identify PPE worn by PWC users	PPE: Buoyancy aid, helmet, eye protection, wetsuit/drysuit, boots, gloves, thermal layers, fins.
		3.2	Select appropriate PPE for a PWC user, dress and perform buddy checks	PPE list, buddy checks.
4	PWC equipment	4.1	Identify PWC equipment for use in flat water environments	Kill cord and spare. Fuel. Trailer for launching and recovery. Flares. Radio. VHF radio. Mobile phone. Extra clothing. Running lights. Tow rope. Tool kit.
5	Avoiding and dealing with emergencies	5.1	Identify useful information prior to using a PWC	Water level information. Boundaries of flat water. Boundaries of safe areas of operation. Daylight hours. Weather forecast. Tide tables. Slipway access / egress, alternative access / egress if no slipway. Access to water level information. Kit list.
		5.2	Ensure appropriate redundancy for passage plan and potential environmental changes	Back up plan for engine failure, multiple PWCs, tow rope, direction of flow, changes in weather / water level. Tides. Daylight hours.
		5.3	Recall what information a PWC user will need in the event of an emergency	What'll happen if I or a passenger falls in. What'll happen if PWC stops working? Hazards, and exit. Who's going to rescue me? Self-rescue? Others? Alerting emergency services? What type of rescue tools may be used to rescue me? Other PWC/boat. Throwbags, buoyant aids etc. How do I assist rescuers? If in water, stay on back, making yourself as big a target as possible, swim towards them etc. Cold water immersion considerations. Night/poor visibility considerations.



	Skill sheet element		Learning outcome	Key teaching points
6	Navigation and route planning	6.1	Identify methods of navigating	GPS, phone GPS, charts, maps, sat nav etc.
		6.2	Orient map to ground and identify how water level changes will affect information represented on map/chart	Loss or gain of areas to launch or recover with changes of water level.
		6.3	Using an appropriate information source, identify tick features that will be seen en route	Passage plan. Return to last point if visibility or comms are lost.
		6.4	Using a map/chart, confirm when at an objective	Three reasons that confirm your position.
		6.5	Use stop/catch features when planning a route	Large features that identify the boundaries of an area.
7	Pre- and post-use PWC checks	7.1	Perform systematic checks of PWC, fuel and engine system, and auxiliary equipment	Obvious holes, cracks, wear or damage. Fuel leakage. Battery level. Linkages: gear and throttle. Impeller damage. Hull damage. Obvious wear or damage. Fuel leakage. Battery level. Cracks to hull. Use of water resistant grease on electrical points.
		7.2	Prep equipment in order to give a clean working space on PWC	All equipment secured in compartments or on sled.
		7.3	Run through pre-start checks prior to starting engine	Fuel: quantity and connection. Kill cord. Neutral/tick over. Intake clear. Forward and reverse bucket in working order. Steering jet working correctly.
		7.4	Perform post-operational checks.	Including flushing through with clean water.
8	Collision avoidance	8.1	Apply International Regulations for the Prevention of Collisions at Sea (IRPCS) in order to safely operate PWCs under a variety of light conditions	Head on situation: pass port to port (steer right). Give way to the right. Power gives way to unpowered craft. Permission to use jet in particular area (eg swimming beaches). Awareness of swimmers in water.



	Skill sheet element		Learning outcome	Key teaching points
9	Medical considerations	9.1	Recall who may be affected by medical issues in water environments	PWC operator, passengers, other water users.
		9.2	Identify signs/symptoms and treatment for common medical issues found in a water environment	Hypothermia (too cold), hyperthermia (too hot), drowning, infection (eg leptospirosis, hepatitis), trauma, eg bank hazards (slips, trips, falls), cold water shock.
		9.3	Recall the importance of minimising exposure to the water and decontamination procedures post-exposure	Check, clean, dry. Hand wipes, face wipes, cover cuts etc.
		9.4	Recall coping strategies when faced with accidental immersion in cold water	Reduced capability due to cold water shock. 1-10-1 rule.
		9.5	Identify bank hazards and suitable control measures to prevent slips, trips and falls	Wet, steep, slippery, muddy banks. Overhanging branches, vegetation. Control measures: zoning, PPE, training.
10	Communications	10.1	Be able to communicate operator to passenger, PWC-to-PWC and PWC-to-shore using hand and whistle signals	Hand signals: Ok, distress, point positive, medical, hold station. Whistle: attention, upstream, downstream, distress.
		10.2	Identify limitations of handheld radios and mobile phones	Potential water ingress on microphone, leading to constant transmission. Identifying affected radio, and informing operator, eg use of hand/whistle signals or coming alongside to check. Mobile phone signal. Waterproofing. Battery.
11	PWC hull, engine and drive types	11.1	Identify how different PWC hull and engine types and construction will affect performance and deployment	Weight and size of PWC and their capabilities, eg stability vs manoeuvrability. Single or multi-skinned hulls. Resilience to damage. Engine size and characteristics including acceleration and fuel efficiency.
		11.2	Recall load rating for individual PWCs and where they can be found	User manuals. Stickers on hulls.



	Skill sheet element		Learning outcome	Key teaching points
12	Launching and recovery	12.1	Identify considerations when launching and recovering via trailer	Terrain. Vehicle access, hand launch or rope lower.
		12.2	Identify hand launch considerations, including manual handling	Manual handling considerations. Slipway, riverbank or beach? Transfer to balloon-tired trolley for soft ground, eg beach.
		12.3	Identify how changing conditions will affect launching/recovery site choice	Water levels. Time pressures. Light. Weather. Tides.
13	PWC handling	13.1	Identify the importance of trim when in displacement and planing mode	Weight shift forward or backward. Balance side to side. Manual trim control if needed. Effect of passengers.
		13.2	Be able to control momentum when travelling, identifying how changes in drive and trim affect steerage and pivot	Appropriate space. Allow for drift. Throttle control to avoid excess speed. Some PWCs do not have neutral, and therefore will continue to move forward when ticking over. Use of forward and reverse to control momentum for slow speed manoeuvres.
		13.3	Be able to change direction of the PWC at speed in wider areas and low speed in confined areas	Appropriate space. Combination of power and steering to complete turns.
		13.4	Manage PWC when coming to or leaving shallow areas, buoy/moorings, and other vessels	Communication from the operator. Avoid sucking debris into intake in shallow areas, eg gravel, seaweed etc. Awareness of other water users.
		13.5	Explain the terms ground speed and water speed, and why they are important with PWC handling	Using markers and transits on land to check speed over ground.
		13.6	Be able to hold station.	Hold position (eg in slow moving water). No upstream / downstream or side to side movement. Prevent drift, no accidental movement.
14	Securing	14.1	Secure a PWC to a mooring position	Secure to eg harbour, beach. Space: allow for swing, changes in tides and wind.



	Skill sheet element		Learning outcome	Key teaching points
15	Personal recovery and self rescue	15.1	Identify methods of self-recovery	Recovery from falling in or malfunction. Actions following falling off, and PWC taken away by flow/waves/wind. Eg swimming after it, use of fins. Methods of getting back on PWC from the side or rear, to prevent flipping of PWC.
		15.2	Perform self-rescue onto PWC whilst in deep water	Self-rescue onto PWC. PWC setup: handles, grab handles, gunwales/hull.
16	Passenger recovery	16.1	Recall different types of passenger recovery	Conscious or unconscious? Contacting emergency services if beyond PWC operator's capability.
		16.2	Use environmental factors in order to make a controlled approach	Approach into the strongest element: wind or flow.
		16.3	Recover a conscious passenger onto PWC	Method of recovery should be based on water speed, depth and hazards. Recover on left-hand side (due to throttle position), then swing around to the back and onto PWC. Operator foot position to prevent twisted knees, eg left foot back. Slow speed.
		16.4	Recall methods for managing an unconscious passenger in the water	Standard first aid protocols (eg DRC-ABC). Contacting emergency services. Use of PWC as buoyant object to support passenger?



	Skill sheet element		Learning outcome	Key teaching points
17	Flips and rights	17.1	Identify steps to minimise the likelihood of a flip occurring	Angle of PWC to flow. Trim. PWC position relative to obstacles. No excessive body movements. If capsizing, try not to pull PWC over completely - push handlebars away from you and position body to allow corrective righting if possible. If PWC still running, use of throttle to complete righting process. Possibility of self-righting?
		17.2	Recall process for dealing with a flipped PWC.	Maintain contact with PWC. Know your PWC: should the PWC only be re-flipped one way or another, eg location and position of air intake.
		17.3	Explain options for whether to re-flip or abandon and variables that would affect this choice	Water speed and depth, proximity to downstream hazards.
		17.4	Perform a re-flip and clear up	Re-flip on the correct side. Awareness of other people in the water. Most effective parts of the PWC to use to increase leverage, eg handlebars or running boards?





Flood Rescue PWC Operator (FPWC)

Course overview and target audience

The Flood Rescue PWC Operator course (FPWC) is for people who operate and perform rescues using personal watercraft (jetskis) in flooding situations.

Contact hours 18 hours (3 days) or 6 hours (1 day) in addition to in-date PWC-F.	Prerequisites Minimum age: 18 Rescue 3 Swiftwater and Flood First Responder (SFR)
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Flood Rescue PWC Operator Instructor (FPWCI)
- Swiftwater and Flood Rescue FPWC Operator (SPWCI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- PWC handling
- Casualty pickup
- Flips and rights



Flood Rescue PWC Operator (FPWC) skill sheet contents

Theory	Practical
1. Rescue 3 philosophy	22. Launching and recovery
2. Training standards and legislation	23. PWC handling in floodwater
3. Best practice guidelines for water rescue	24. Anchoring and securing
4. Hydrology and water hazards	25. Search operations
5. Floodwater dynamics and hazards	26. Team/personal recovery
6. Flood theory	27. Casualty pickup and recovery
7. Personal equipment	28. Casualty management
8. PWC equipment	29. PWC rescue sleds
9. Pre-planning	30. Transporting loads
10. Risk assessments	31. Towing
11. Navigation and route planning	32. PWC and engine maintenance
12. Pre- and post-use PWC checks	33. Flips and rights
13. Medical and decontamination considerations	
14. Considerations for night/poor visibility operations	
15. Crew operational roles	
16. Introduction to searching rivers and floods	
17. Helicopter familiarisation	
18. Communications	
19. Multiple PWC operations	
20. Introduction to rescues from vehicles in water	
21. PWC hull, engine and drive types	



Flood Rescue PWC Operator (FPWC) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Rescue 3 philosophy	1.1	Explain the order of priorities at a water rescue scene	Self > team > victim
		1.2	Recall the steps required in order to develop judgement	Training. Practice. Experience. Judgement.
		1.3	Apply best practice guidelines to personal watercraft (PWC) operations, in order to produce safe working practice.	Always have a backup plan: downstream exit for engine failure.
2	Training standards and legislation	2.1	Recognise the different levels of training with the Rescue 3 scheme, and identify the role of a personal watercraft at a rescue scene.	PWC courses. Powerboat courses. Water rescue courses (eg SRT). Greater capability for access and transportation.
		2.2	State how the Rescue 3 scheme fits within national and international standards	Rescue 3 standards, other standards eg NFPA, DEFRA.
		2.3	Identify where personal watercraft fit into rescue options	Deep water, expansive flooding, swiftwater, multiple transfers of welfare and people.
3	Best practice guidelines for water rescue	3.1	Apply the Best Practice Guidelines for Water Rescue combine to produce safer working practice	Best Practice Guidelines for Water Rescue (formerly known as 15 Absolutes)

FPWC



	Skill sheet element		Learning outcome	Key teaching points
4	Hydrology and water hazards	4.1	Recall the definitions of basic water, moving water, coastal water, swiftwater and whitewater	Basic water - typically still, flat water, eg lakes, ponds, canals. Moving - flowing down gradient, eg streams, rivers, drainage channels. Coastal water - eg coastal sea, ocean, estuaries. Swiftwater - fast moving, steeper gradient, eg steep rivers, drainage channels, flash flood conditions. Whitewater - fast moving, steeper gradient, used for kayaking, rafting
		4.2	Identify the effect that volume, gradient and obstacles have on water	Volume - increase in energy. Gradient - increase in speed. Obstacles - creation of retentive water features, impact risk, siphon/strainer risk
		4.3	Identify water features	Laminar flow, helical flow, current vector, eddies, upstream V, downstream V, undercuts, strainers, siphons, standing waves, hydraulics, weirs
		4.4	Describe the impact water features would have on individuals in water	Force of water, river grading system, entrapments
		4.5	Identify general water hazards, and suitable control measures	Depth, temperature, weather
		4.6	Identify water hazards in a basic water environment, and suitable control measures	Lake/canal bed morphology, entrapments, canals/canal locks, debris
		4.7	Identify water hazards in a moving water environment, and suitable control measures	Volume, gradient, undercuts, strainers, siphons, hydraulics, weirs, inspection covers, bridge pillars, entrapments



	Skill sheet element		Learning outcome	Key teaching points
5	Floodwater dynamics and hazards	5.1	Identify the physical impact of water flowing within an urban area	Loss of access / egress. Food and medicine shortage. Loss of power and clean water supply.
		5.2	Identify how public services and infrastructure will contribute to physical, chemical and biological hazards within flooding	HAZMAT considerations. Strainers and sharps. Underwater obstacles: ledges, bollards, steps.
		5.3	Explain the effect of these on personal watercraft operating in floodwater	Sudden changes in depth. Hazards may cause damage. PWC may get stuck or wrapped.
6	Flood theory	6.1	Identify the four phases of a flood, and the associated hazards	Pre-flood. Flash flood. Expansion. Recovery. Phase-specific hazards
		6.2	Identify how flood warnings will correspond with phases of flooding	European Flood Awareness System (EFAS), national flood information
		6.3	State what tasks an individual trained to this level would carry out during the phases of a flooding event	FPWC remit and role in flood events
7	Personal equipment	7.1	Identify PPE used for in-water operations by personal watercraft operators	PPE: Buoyancy aid, helmet, eye protection, throwbag, drysuit, boots, gloves, thermal layers, swim fins for rescuer.
		7.2	Select appropriate PPE for a personal watercraft operator, dress and perform buddy checks	PPE list, buddy checks.
8	PWC equipment	8.1	Identify PWC equipment used for in-water operations and rescues	Sleds. Attachment points to avoid foot entrapment, eg side bungees of sled attached to points on hull, not endplate. Kill cord and spare. Cut-off switch. Navigation equipment. First aid kit. Fire extinguisher. Flares. Last chance handles. Bungee cords. Hood straps, compartment straps and seat straps. Rescue tubes. Towing eye for sled.



	Skill sheet element		Learning outcome	Key teaching points
9	Pre-planning	9.1	Identify sources of information useful for pre-planning personal watercraft operations	River guides (online and books), tide tables (online and booklet), online river gauges.
		9.2	Describe key information that should be included within a pre-plan specific to personal watercraft	Slipway access / egress, alternative access / egress if no slipway. Access to water level information. Task specific kit list. Emergency RV.
10	Risk assessments	10.1	Ensure appropriate redundancy for passage plan and potential environmental changes	Back up plan for engine failure, multiple PWCs, direction of flow, changes in weather / water level.
		10.2	Perform a risk assessment of the following areas: rescue site, downstream and upstream	Depth of water, debris, hazards.
		10.3	Based on risk assessment of environment and casualty requirements, select an appropriate plan	Is a PWC, boat or SFR solution needed?



	Skill sheet element		Learning outcome	Key teaching points
11	Navigation and route planning	11.1	Apply International Regulations for the Prevention of Collisions at Sea (IRPCS) in order to safely operate PWCs under a variety of light conditions	Head on situation: pass port to port (steer right). Give way to the right. Power gives way to unpowered craft.
		11.2	Orient map to ground and identify how water level changes will affect information represented on map/chart	Loss or gain of access with changes of water level.
		11.3	Using an appropriate information source, identify tick features that will be seen en route	Passage plan. Return to last point if visibility or comms are lost.
		11.4	Using a map/chart, confirm when at an objective	Three reasons that confirm your position.
		11.5	Be able to use a sat nav unit in a flooded urban environment	Use of sat nav
		11.6	Use stop/catch features when planning a route	Large features that identify the end of a search or working area.
12	Pre- and post-use PWC checks	12.1	Perform systematic checks of PWC, fuel and engine system, and auxiliary equipment	Obvious holes, cracks, wear or damage. Fuel leakage. Battery level. Linkages: gear and throttle. Impeller damage. Hull damage. Obvious wear or damage. Fuel leakage. Battery level. Cracks to hull. Use of water resistant grease on electrical points.
		12.2	Prep equipment in order to give a clean working space on PWC	All equipment secured in compartments or on sled.
		12.3	Run through pre-start checks prior to starting engine	Fuel: quantity and connection. Kill cord. Neutral/tick over. Intake clear. Forward and reverse bucket in working order. Steering jet working correctly.
		12.4	Perform post-operational checks.	Including flushing through with clean water.



	Skill sheet element		Learning outcome	Key teaching points
13	Medical and decontamination considerations	13.1	Identify priorities when dealing with casualties from PWC mid-water and a dry location	Temperature and major trauma.
		13.2	Apply techniques which minimise exposure to the water and decontamination procedures	Remain on PWC to minimise exposure to HAZMAT. Gels, wipes and sprays post-exposure.
14	Considerations for night/poor visibility operations	14.1	Identify problems associated with hazard recognition, group control and application of rescue techniques during night/poor visibility operations	Depth perception. Comms. Line of sight. Awareness of speed over ground. Water depth. Debris.
		14.2	Identify control measures that may be required when operating PWCs in darkness/poor visibility	Slower travelling speeds. Personal, scene and PWC lighting. Buddy system and roll call.
15	Crew operational roles	15.1	Explain the primary roles of operator and rescuer within a PWC, and their duties	Operator: overall control, clear comms Rescuer: hands on casualty, enters the water if required.
		15.2	Apply crew roles when performing a variety of tasks	Clear communication and allocation of roles.



	Skill sheet element		Learning outcome	Key teaching points
16	Introduction to searching rivers and floods	16.1	Identify appropriate search models	Koester's bike wheel analogy - axle, hub, spokes, rim, reflectors
		16.2	State what tasks an individual trained to this level would carry out during a river-based primary search	Reconnaissance including identifying hazards, identifying locations for secondary search, shout and listen techniques, quick visual sweeps. Reporting
		16.3	State what tasks an individual trained to this level would carry out during a river-based secondary search	Searching identified hotspots from the PWC.
		16.4	State what tasks an individual trained to this level would carry out during a flood-based primary search	Reconnaissance including identifying hazards, identifying locations for secondary search, house to house shout and listen techniques, quick visual sweeps. Reporting
		16.5	State what tasks an individual trained to this level would carry out during a flood-based secondary search	Secondary search low coverage - searching hotspots highlighted in primary search. Secondary search high coverage - full search of buildings, removal of debris from buildings, no further searching will take place after this. Potential for body recovery. Body recovery considerations
17	Helicopter familiarisation	17.1	Identify hazards and control measures associated with helicopters	Noise, downwash, communication difficulties, landing area, overhead power lines, trees etc
		17.2	Describe the benefits and hazards of working with helicopters	Possibly the only option. Downdraft.
		17.3	Identify the impact of a helicopter on the operations scene and craft	Clearing the area. Securing equipment. Debris.



	Skill sheet element		Learning outcome	Key teaching points
18	Communications	18.1	Be able to communicate PWC-to-PWC and PWC-to-shore using hand and whistle signals	Hand signals: Ok, distress, point positive, medical, hold station. Whistle: attention, upstream, downstream, distress.
		18.2	Apply simple commands in order to centralise command	Commands for changing trim, tying or untying the PWC, exiting or entering the PWC should all come from the helm.
		18.3	Identify limitations of handheld radios	Potential water ingress on microphone, leading to constant transmission. Identifying affected radio, and informing operator, eg use of hand/whistle signals or coming alongside to check.
19	Multiple PWC operations	19.1	Identify the roles and the benefits of working with multiple PWCs.	Downstream cover / containment.
		19.2	Explain how working with multiple PWCs adds resilience to operations.	Back up for damaged PWCs / engines.
20	Introduction to rescues from vehicles in water	20.1	Identify why vehicles in water are a common occurrence in a flood event	Deliberate or misadventure.
		20.2	Describe forces acting on a vehicle in water	Water flow, depth, vehicle mass and surface traction.
		20.3	Describe boat and vehicle interaction, stability of vehicles, and direction of approach options	Boat wake. Accidental contact. Potential for vehicle to move.
21	PWC hull, engine and drive types	21.1	Identify how different PWC hull and engine types and construction will affect performance and deployment	Weight and size of PWC and their capabilities, eg stability vs manoeuvrability. Single or multi-skinned hulls. Resilience to damage. Engine size and characteristics including acceleration and fuel efficiency.
		21.2	Recall local and/or national safety labelling requirements for PWCs	Local or national safety labelling, eg electrical battery, jet nozzle, flipping, person capacity, extinguisher location, CE markings.



	Skill sheet element		Learning outcome	Key teaching points
22	Launching and recovery	22.1	Identify considerations when launching and recovering via trailer	Terrain. Vehicle access, hand roll or rope lower.
		22.2	Identify hand launch considerations, including manual handling	Manual handling considerations. Slipway, riverbank or beach? Transfer to balloon-tyred trolley.
		22.3	Identify how changing conditions and deployment will affect launching/recovery site choice	Water levels. Time pressures. Light. Weather.



	Skill sheet element		Learning outcome	Key teaching points
23	PWC handling in floodwater	23.1	Identify the importance of trim when in displacement and planing mode	Weight shift forward or backward. Balance side to side. Manual trim control if needed.
		23.2	Be able to control momentum when travelling, identifying how changes in drive and trim affect steerage and pivot	Appropriate space. Allow for drift. Some PWCs do not have neutral, and therefore will continue to move forward when ticking over. Use of forward and reverse to control momentum.
		23.3	Be able to change direction of the PWC at speed in wider areas and low speed in confined areas	Appropriate space. Combination of power and steering to complete turns.
		23.4	Manage PWC when coming to or leaving shallow areas, buoy/ moorings, and other vessels	Communication from the operator. Avoid sucking debris into intake in shallow areas, eg gravel, seaweed etc. Awareness of other water users.
		23.5	Explain the terms ground speed and water speed, and why they are important with PWC handling	Using markers on land to check speed over ground.
		23.6	Be able to hold station.	Hold position in the flow. No upstream / downstream or side to side movement. Prevent drift, no accidental movement.
		23.7	Perform a friction lock to hold a PWC against an object.	Halving the distance to object with each movement. Angle, trim and revs to hold lock.
		23.8	Apply the use of a variety of angles relative to the current vector when dealing with downstream flow, eddies and flow around obstacles	Cross flow without unintentional upstream / downstream movement. Predict the effect future water will have on the PWC.
		23.9	Perform direct and indirect break-ins, and direct outs, comparing the different methods, and selecting an appropriate technique depending on task	Water speed, PWC speed., Size and depth of eddy.



	Skill sheet element		Learning outcome	Key teaching points
24	Anchoring/securing	24.1	Identify why anchoring/securing a rescue PWC would be required	Casualty recovery. Downstream containment. Switch to SFR rescue.
		24.2	Recognise types of tethers/anchors depending on area, boat size and design	Size of anchor and type eg mud.
		24.3	Perform deployment, including measurement of depth and checks to ensure anchor is holding	Space: allow for swing.
25	Search operations	25.1	Explain how PWCs could be incorporated into the search process	Containment. Primary search. Transport for searchers. Platform for secondary search. Transport for casualty evacuation.
		25.2	Use PWCs to identify key landmarks that define the search area.	Start and finish of search area. Containment.
		25.3	Construct deployment strategy to perform reconnaissance, a primary (low coverage) search, and a high coverage search	Passage plan. Key landmarks - attack points. Additional equipment that may be required for high coverage search.
26	Team/personal recovery	26.1	Identify reasoning behind team/self-rescue ability	Recovery from rescue or malfunction. Reduces task loading on other crew members. Actions following falling off, and PWC taken away by flow/waves/wind. Eg swimming after it, use of fins.
		26.2	Perform self-rescue onto PWC whilst in deep water	Self-rescue onto PWC. PWC setup: handles, grab handles, gunwales/hull.



	Skill sheet element		Learning outcome	Key teaching points
27	Casualty pickup and recovery	27.1	Recall team roles for casualty pickup and recovery	PWC operator and rescuer.
		27.2	Use environmental factors in order to make a controlled approach	Approach into the strongest element: wind or flow.
		27.3	Recover casualties onto PWC/rescue sled	Method of recovery should be based on water speed, depth and hazards. Conscious or unconscious? Recover on left-hand side (due to throttle position), then swing around to the back and onto rescue sled. Operator foot position to prevent twisted knees, eg left foot back. Slow speed.
28	Casualty management	28.1	Identify priorities for casualty care	Breathing, temperature and major trauma.
		28.2	Describe how casualty care would impact on PWC handling, length of transit and operation	Reduced capability of operator and rescuer. More load will affect engine performance.
		28.3	Identify suitable placement of casualty once aboard and how medical stabilisation would influence this	Transport on rescue sled or bring up onto ski, based on single operator rescue, or two person operator and rescuer. Temperature concerns for long transits, eg wind chill.
29	PWC rescue sleds	29.1	Identify different types of PWC rescue sleds and when they would be used	PWC rescue sled options - rigid vs inflatable, pros and cons. Eg, storage, stiffness, weight, damage to rescuers and victims if hit by sled.
		29.2	Operate a PWC with a rescue sled, and recover a casualty onto the sled	Practical recovery of casualty onto sled. Single operator. Operator and rescuer. Conscious or unconscious.



	Skill sheet element		Learning outcome	Key teaching points
30	Transporting loads	30.1	Identify methods of attaching water rescue sleds to PWC for transporting loads and victims, eg flood evacuation	Water rescue sled pulled up onto PWC rescue sled. Water rescue sled attached directly to rear of PWC. Wind speed and its effect on unloaded water rescue sled. Slow speed manoeuvring to prevent sled sliding off PWC rescue sled, or victims falling out. Maximum capacity of water rescue sled. Power of PWC.
		30.2	Identify content of briefing and safety provision for casualties or third parties	Position - stay central. Do not anticipate future turns by leaning. No big movements. Stay low. Hold on.
		30.3	Describe how PWC stability is affected during loading/unloading of casualties and loads	Additional load will change PWC trim, eg nose up.
		30.4	Describe how PWC performance and handling is affected when loaded	PWC's ability to hold station and drive upstream. Weight of load vs PWC power. Speed of current or wind vs direction of travel.
		30.5	Identify the risks involved when securing loads to PWCs	Likelihood and consequence of a flip. Never tie casualty into water rescue sled or onto PWC rescue sled.
31	Towing	31.1	Perform line astern tows	Advantages / disadvantages. Attachment points. Releasable system. Speed.
		31.2	Identify variables that influence line astern tows	Space to manoeuvre. Distance to travel. Water conditions, including speed. Stability. Steering.
		31.3	Identify areas that will require management during towing.	Fuel usage, damage to vessels, tensioned lines and weight distribution.
32	PWC and engine maintenance	32.1	Troubleshoot to identify problems and quick fix where possible	Battery, loose connections



	Skill sheet element		Learning outcome	Key teaching points
33	Flips and rights	33.1	Identify steps to minimise the likelihood of a flip occurring	Angle of PWC to flow. Trim. PWC position relative to obstacles. No excessive body movements. If capsizing, try not to pull PWC over completely - push handlebars away from you and position body to allow corrective righting if possible. If PWC still running, use of throttle to complete righting process. Possibility of self-righting?
		33.2	Recall process for dealing with a flipped PWC.	Head count. Maintain contact with PWC. Re-flip, or abandon PWC. Know your PWC: should the PWC only be re-flipped one way or another, eg location and position of air intake.
		33.3	Explain options for whether to re-flip or abandon and variables that would affect this choice	Water speed and depth, proximity to downstream hazards.
		33.4	Perform a re-flip and clear up	Re-flip on the correct side. Awareness of other people in the water. Most effective parts of the PWC to use to increase leverage, eg handlebars or running boards?



Swiftwater and Flood Rescue PWC Operator (SPWC)

Course overview and target audience

The Swiftwater and Flood Rescue PWC Operator course (SFPWC) is for people who operate and perform rescues using personal watercraft (jetskis) in swiftwater and flooding situations. The course builds upon the content of the FPWC, allowing for plenty of practical time operating PWCs in swiftwater.

Contact hours 24 hours (4 days) Or 2 days (12 hours) in addition to in-date PWC-F.	Prerequisites Minimum age: 18 Rescue 3 Swiftwater and Flood Rescue Technician (SRT)
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Swiftwater and Flood Rescue Personal Watercraft Operator Instructor (SPWCI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- PWC handling
- Casualty pickup
- Flips and rights



Swiftwater and Flood Rescue PWC Operator (SPWC) skill sheet contents

Theory	Practical
1. Rescue 3 philosophy	22. Launching and recovery
2. Training standards and legislation	23. PWC handling in swiftwater
3. Best practice guidelines for water rescue	24. Anchoring and securing
4. Hydrology and water hazards	25. Search operations
5. Floodwater dynamics and hazards	26. Team/personal recovery
6. Flood theory	27. Casualty pickup and recovery
7. Personal equipment	28. Casualty management
8. PWC equipment	29. PWC rescue sleds
9. Pre-planning	30. Transporting loads
10. Risk assessments	31. Towing
11. Navigation and route planning	32. PWC and engine maintenance
12. Pre- and post-operational checks	33. Flips and rights
13. Medical and decontamination considerations	
14. Considerations for night/poor visibility operations	
15. Crew operational roles	
16. Introduction to searching rivers and floods	
17. Helicopter familiarisation	
18. Communications	
19. Multiple PWC operations	
20. Introduction to rescues from vehicles in water	
21. PWC hull, engine and drive types	



Swiftwater and Flood Rescue PWC Operator (SPWC) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Rescue 3 philosophy	1.1	Explain the order of priorities at a water rescue scene	Self > team > victim
		1.2	Recall the steps required in order to develop judgement	Training. Practice. Experience. Judgement.
		1.3	Apply best practice guidelines to personal watercraft (PWC) operations, in order to produce safe working practice.	Always have a backup plan: downstream exit for engine failure.
2	Training standards and legislation	2.1	Recognise the different levels of training with the Rescue 3 scheme, and identify the role of a personal watercraft at a rescue scene.	PWC courses. Powerboat courses. Water rescue courses (eg SRT). Greater capability for access and transportation.
		2.2	State how the Rescue 3 scheme fits within national and international standards	Rescue 3 standards, other standards eg NFPA, DEFRA.
		2.3	Identify where personal watercraft fit into rescue options	Deep water, expansive flooding, swiftwater, multiple transfers of welfare and people.
3	Best practice guidelines for water rescue	3.1	Apply the Best Practice Guidelines for Water Rescue combine to produce safer working practice	Best Practice Guidelines for Water Rescue (formerly known as 15 Absolutes)

SPWC



	Skill sheet element		Learning outcome	Key teaching points
4	Hydrology and water hazards	4.1	Recall the definitions of basic water, moving water, coastal water, swiftwater and whitewater	Basic water - typically still, flat water, eg lakes, ponds, canals. Moving - flowing down gradient, eg streams, rivers, drainage channels. Coastal water - eg coastal sea, ocean, estuaries. Swiftwater - fast moving, steeper gradient, eg steep rivers, drainage channels, flash flood conditions. Whitewater - fast moving, steeper gradient, used for kayaking, rafting
		4.2	Identify the effect that volume, gradient and obstacles have on water	Volume - increase in energy. Gradient - increase in speed. Obstacles - creation of retentive water features, impact risk, siphon/strainer risk
		4.3	Identify water features	Laminar flow, helical flow, current vector, eddies, upstream V, downstream V, undercuts, strainers, siphons, standing waves, hydraulics, weirs
		4.4	Describe the impact water features would have on individuals in water	Force of water, river grading system, entrapments
		4.5	Identify general water hazards, and suitable control measures	Depth, temperature, weather
		4.6	Identify water hazards in a basic water environment, and suitable control measures	Lake/canal bed morphology, entrapments, canals/canal locks, debris
		4.7	Identify water hazards in a moving water environment, and suitable control measures	Volume, gradient, undercuts, strainers, siphons, hydraulics, weirs, inspection covers, bridge pillars, entrapments



	Skill sheet element		Learning outcome	Key teaching points
5	Floodwater dynamics and hazards	5.1	Identify the physical impact of water flowing within an urban area	Loss of access / egress. Food and medicine shortage. Loss of power and clean water supply.
		5.2	Identify how public services and infrastructure will contribute to physical, chemical and biological hazards within flooding	HAZMAT considerations. Strainers and sharps. Underwater obstacles: ledges, bollards, steps.
		5.3	Explain the effect of these on personal watercraft operating in floodwater	Sudden changes in depth. Hazards may cause damage. PWC may get stuck or wrapped.
6	Flood theory	6.1	Identify the four phases of a flood, and the associated hazards	Pre-flood. Flash flood. Expansion. Recovery. Phase-specific hazards
		6.2	Identify how flood warnings will correspond with phases of flooding	European Flood Awareness System (EFAS), national flood information
		6.3	State what tasks an individual trained to this level would carry out during the phases of a flooding event	SPWC remit and role in flood events
7	Personal equipment	7.1	Identify PPE used for in-water operations by personal watercraft operators	PPE: Buoyancy aid, helmet, eye protection, throwbag, drysuit, boots, gloves, thermal layers, swim fins for rescuer.
		7.2	Select appropriate PPE for a personal watercraft operator, dress and perform buddy checks	PPE list, buddy checks.



	Skill sheet element		Learning outcome	Key teaching points
8	PWC equipment	8.1	Identify PWC equipment used for in-water operations and rescues	Sleds. Attachment points to avoid foot entrapment, eg side bungees of sled attached to points on hull, not endplate. Kill cord and spare. Cut-off switch. Navigation equipment. First aid kit. Fire extinguisher. Flares. Last chance handles. Bungee cords. Hood straps, compartment straps and seat straps. Rescue tubes. Towing eye for sled.
9	Pre-planning	9.1	Identify sources of information useful for pre-planning personal watercraft operations	River guides (online and books), tide tables (online and booklet), online river gauges.
		9.2	Describe key information that should be included within a pre-plan specific to personal watercraft	Slipway access / egress, alternative access / egress if no slipway. Access to water level information. Task specific kit list. Emergency RV.
10	Risk assessments	10.1	Ensure appropriate redundancy for passage plan and potential environmental changes	Back up plan for engine failure, multiple PWCs, direction of flow, changes in weather / water level.
		10.2	Perform a risk assessment of the following areas: rescue site, downstream and upstream	Depth of water, debris, hazards.
		10.3	Based on risk assessment of environment and casualty requirements, select an appropriate plan	Is a PWC, boat or SRT solution needed?



	Skill sheet element		Learning outcome	Key teaching points
11	Navigation and route planning	11.1	Apply International Regulations for the Prevention of Collisions at Sea (IRPCS) in order to safely operate PWCs under a variety of light conditions	Head on situation: pass port to port (steer right). Give way to the right. Power gives way to unpowered craft.
		11.2	Orient map to ground and identify how water level changes will affect information represented on map/chart	Loss or gain of access with changes of water level.
		11.3	Using an appropriate information source, identify tick features that will be seen en route	Passage plan. Return to last point if visibility or comms are lost.
		11.4	Using a map/chart, confirm when at an objective	Three reasons that confirm your position.
		11.5	Be able to use a sat nav unit in a flooded urban environment	Use of sat nav
		11.6	Use stop/catch features when planning a route	Large features that identify the end of a search or working area.
12	Pre- and post-use PWC checks	12.1	Perform systematic checks of PWC, fuel and engine system, and auxiliary equipment	Obvious holes, cracks, wear or damage. Fuel leakage. Battery level. Linkages: gear and throttle. Impeller damage. Hull damage. Obvious wear or damage. Fuel leakage. Battery level. Cracks to hull. Use of water resistant grease on electrical points.
		12.2	Prep equipment in order to give a clean working space on PWC	All equipment secured in compartments or on sled.
		12.3	Run through pre-start checks prior to starting engine	Fuel: quantity and connection. Kill cord. Neutral/tick over. Intake clear. Forward and reverse bucket in working order. Steering jet working correctly.
		12.4	Perform post-operational checks.	Including flushing through with clean water.



	Skill sheet element		Learning outcome	Key teaching points
13	Medical and decontamination considerations	13.1	Identify priorities when dealing with casualties from PWC mid-water and a dry location	Temperature and major trauma.
		13.2	Apply techniques which minimise exposure to the water and decontamination procedures	Remain on PWC to minimise exposure to HAZMAT. Gels, wipes and sprays post-exposure.
14	Considerations for night/poor visibility operations	14.1	Identify problems associated with hazard recognition, group control and application of rescue techniques during night/poor visibility operations	Depth perception. Comms. Line of sight. Awareness of speed over ground. Water depth. Debris.
		14.2	Identify control measures that may be required when operating PWCs in darkness/poor visibility	Slower travelling speeds. Personal, scene and PWC lighting. Buddy system and roll call.
15	Crew operational roles	15.1	Explain the primary roles of operator and rescuer within a PWC, and their duties	Operator: overall control, clear comms Rescuer: hands on casualty, enters the water if required.
		15.2	Apply crew roles when performing a variety of tasks	Clear communication and allocation of roles.



	Skill sheet element		Learning outcome	Key teaching points
16	Introduction to searching rivers and floods	16.1	Identify appropriate search models	Koester's bike wheel analogy - axle, hub, spokes, rim, reflectors
		16.2	State what tasks an individual trained to this level would carry out during a river-based primary search	Reconnaissance including identifying hazards, identifying locations for secondary search, shout and listen techniques, quick visual sweeps. Reporting
		16.3	State what tasks an individual trained to this level would carry out during a river-based secondary search	Searching identified hotspots from the PWC.
		16.4	State what tasks an individual trained to this level would carry out during a flood-based primary search	Reconnaissance including identifying hazards, identifying locations for secondary search, house to house shout and listen techniques, quick visual sweeps. Reporting
		16.5	State what tasks an individual trained to this level would carry out during a flood-based secondary search	Secondary search low coverage - searching hotspots highlighted in primary search. Secondary search high coverage - full search of buildings, removal of debris from buildings, no further searching will take place after this. Potential for body recovery. Body recovery considerations
17	Helicopter familiarisation	17.1	Identify hazards and control measures associated with helicopters	Noise, downwash, communication difficulties, landing area, overhead power lines, trees etc
		17.2	Describe the benefits and hazards of working with helicopters	Possibly the only option. Downdraft.
		17.3	Identify the impact of a helicopter on the operations scene and craft	Clearing the area. Securing equipment. Debris.



	Skill sheet element		Learning outcome	Key teaching points
18	Communications	18.1	Be able to communicate PWC-to-PWC and PWC-to-shore using hand and whistle signals	Hand signals: Ok, distress, point positive, medical, hold station. Whistle: attention, upstream, downstream, distress.
		18.2	Apply simple commands in order to centralise command	Commands for changing trim, tying or untying the PWC, exiting or entering the PWC should all come from the helm.
		18.3	Identify limitations of handheld radios	Potential water ingress on microphone, leading to constant transmission. Identifying affected radio, and informing operator, eg use of hand/whistle signals or coming alongside to check.
19	Multiple PWC operations	19.1	Identify the roles and the benefits of working with multiple PWCs.	Downstream cover / containment.
		19.2	Explain how working with multiple PWCs adds resilience to operations.	Back up for damaged PWCs / engines.
20	Introduction to rescues from vehicles in water	20.1	Identify why vehicles in water are a common occurrence in a flood event	Deliberate or misadventure.
		20.2	Describe forces acting on a vehicle in water	Water flow, depth, vehicle mass and surface traction.
		20.3	Describe boat and vehicle interaction, stability of vehicles, and direction of approach options	Boat wake. Accidental contact. Potential for vehicle to move.
21	PWC hull, engine and drive types	21.1	Identify how different PWC hull and engine types and construction will affect performance and deployment	Weight and size of PWC and their capabilities, eg stability vs manoeuvrability. Single or multi-skinned hulls. Resilience to damage. Engine size and characteristics including acceleration and fuel efficiency.
		21.2	Recall local and/or national safety labelling requirements for PWCs	Local or national safety labelling, eg electrical battery, jet nozzle, flipping, person capacity, extinguisher location, CE markings.



	Skill sheet element		Learning outcome	Key teaching points
22	Launching and recovery	22.1	Identify considerations when launching and recovering via trailer	Terrain. Vehicle access, hand roll or rope lower.
		22.2	Identify hand launch considerations, including manual handling	Manual handling considerations. Slipway, riverbank or beach? Transfer to balloon-tyred trolley.
		22.3	Identify how changing conditions and deployment will affect launching/recovery site choice	Water levels. Time pressures. Light. Weather.



	Skill sheet element		Learning outcome	Key teaching points
23	PWC handling in swiftwater	23.1	Identify the importance of trim when in displacement and planing mode	Weight shift forward or backward. Balance side to side. Manual trim control if needed.
		23.2	Be able to control momentum when travelling, identifying how changes in drive and trim affect steerage and pivot	Appropriate space. Allow for drift. Some PWCs do not have neutral, and therefore will continue to move forward when ticking over. Use of forward and reverse to control momentum. Avoidance of cavitation in aerated water.
		23.3	Be able to change direction of the PWC at speed in wider areas and low speed in confined areas	Appropriate space. Combination of power and steering to complete turns.
		23.4	Manage PWC when coming to or leaving shallow areas, buoy/ moorings, and other vessels	Communication from the operator. Avoid sucking debris into intake in shallow areas, eg gravel, seaweed etc. Awareness of other water users.
		23.5	Explain the terms ground speed and water speed, and why they are important with PWC handling	Using markers on land to check speed over ground.
		23.6	Be able to hold station.	Hold position in the flow. No upstream / downstream or side to side movement. Prevent drift, no accidental movement.
		23.7	Perform a friction lock to hold a PWC against an object.	Halving the distance to object with each movement. Angle, trim and revs to hold lock.
		23.8	Apply the use of a variety of angles relative to the current vector when dealing with downstream flow, eddies and flow around obstacles	Cross flow without unintentional upstream / downstream movement. Predict the effect future water will have on the PWC.
		23.9	Perform direct and indirect break-ins, and direct outs, comparing the different methods, and selecting an appropriate technique depending on task	Water speed, PWC speed., Size and depth of eddy.



	Skill sheet element		Learning outcome	Key teaching points
24	Anchoring/securing	24.1	Identify why anchoring/securing a rescue PWC would be required	Casualty recovery. Downstream containment. Switch to SRT rescue.
		24.2	Recognise types of tethers/anchors depending on area, boat size and design	Size of anchor and type eg mud.
		24.3	Perform deployment, including measurement of depth and checks to ensure anchor is holding	Space: allow for swing.
25	Search operations	25.1	Explain how PWCs could be incorporated into the search process	Containment. Primary search. Transport for searchers. Platform for secondary search. Transport for casualty evacuation.
		25.2	Use PWCs to identify key landmarks that define the search area.	Start and finish of search area. Containment.
		25.3	Construct deployment strategy to perform reconnaissance, a primary (low coverage) search, and a high coverage search	Passage plan. Key landmarks - attack points. Additional equipment that may be required for high coverage search.
26	Team/personal recovery	26.1	Identify reasoning behind team/self-rescue ability	Recovery from rescue or malfunction. Reduces task loading on other crew members. Actions following falling off, and PWC taken away by flow/waves/wind. Eg swimming after it, use of fins.
		26.2	Perform self-rescue onto PWC whilst in deep water	Self-rescue onto PWC. PWC setup: handles, grab handles, gunwales/hull.



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		27.3	Recover casualties onto PWC/rescue sled	Method of recovery should be based on water speed, depth and hazards. Conscious or unconscious? Recover on left-hand side (due to throttle position), then swing around to the back and onto rescue sled. Operator foot position to prevent twisted knees, eg left foot back. Slow speed.
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		28.3	Identify suitable placement of casualty once aboard and how medical stabilisation would influence this	Transport on rescue sled or bring up onto ski, based on single operator rescue, or two person operator and rescuer. Temperature concerns for long transits, eg wind chill.
29	PWC rescue sleds	29.1	Identify different types of PWC rescue sleds and when they would be used	PWC rescue sled options - rigid vs inflatable, pros and cons. Eg, storage, stiffness, weight, damage to rescuers and victims if hit by sled.
		29.2	Operate a PWC with a rescue sled, and recover a casualty onto the sled	Practical recovery of casualty onto sled. Single operator. Operator and rescuer. Conscious or unconscious.



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		31.3	Identify areas that will require management during towing.	Fuel usage, damage to vessels, tensioned lines and weight distribution.
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		33.2	Recall process for dealing with a flipped PWC.	Head count. Maintain contact with PWC. Re-flip, or abandon PWC. Know your PWC: should the PWC only be re-flipped one way or another, eg location and position of air intake.
		33.3	Explain options for whether to re-flip or abandon and variables that would affect this choice	Water speed and depth, proximity to downstream hazards.
		33.4	Perform a re-flip and clear up	Re-flip on the correct side. Awareness of other people in the water. Most effective parts of the PWC to use to increase leverage, eg handlebars or running boards?





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