
Appendix E

Project Safeguard Plans

ADMIRALTY INLET PILOT TIDAL PROJECT
FERC PROJECT NO. 12690

PROJECT SAFEGUARD PLANS
(submitted with the Final Application for a New Pilot Project License)

Submitted by:
Public Utility District No. 1 of Snohomish County



February 29, 2012
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PROJECT SAFEGUARD PLANS

for the Admiralty Inlet Pilot Tidal Project

The Project Safeguard Plans describe the procedures Public Utility District No. 1 of Snohomish County (the District) will undertake to safeguard the public and environmental resources for the Admiralty Inlet Pilot Tidal Project (FERC No. 12690) (the Project). The plans within this document address (1) Project and public safety, (2) navigational safety, (3) emergency shutdown of one or both turbines, and (4) removal of the Project and restoration of the site, if required. These plans were developed in consultation with the Marine Aquatic Resource Committee (MARC) and Project stakeholders. Comments received from the consulted parties, as well as the District's written response, are included with the District's June 24, 2011, response to the Commission's request for additional information.¹

1.0 INTRODUCTION

The District is engaged in licensing and permitting the Admiralty Inlet Pilot Tidal Project in Puget Sound, Washington. The Project involves installation of two OpenHydro tidal in-stream energy conversion turbines in Admiralty Inlet, as well as placement of two transmission cables to shore. The turbines will be installed in the northeastern portion of Admiralty Inlet, approximately 1 km west-southwest of Admiralty Head near latitude 48°09'03.24" N longitude 122°41'15.72" W latitude, in water depth of approximately 58 meters. Power generated by the project will be transmitted via two subsea cables to a new control building proposed on a private parcel approximately 2,000 feet west of the ferry terminal. Grid compliant power from the control building would exit the property and connect to the local Puget Sound Energy infrastructure.

2.0 PROJECT AND PUBLIC SAFETY PLAN

The Project presents little to no known hazard to public safety, due primarily to its location, the design of the turbines, and the activities typically occurring in the area. The Project is located outside major shipping lanes, in waters not used for commercial fishing. Project turbines will be located in waters approximately 58 meters deep, deeper waters than are typically used by recreational users, and presenting minimal hazard to tug or barge vessels. Recreational diving in the area is typically conducted in shallow waters closer to shore and away from such strong currents. The Project's subsea transmission trunk cable will be routed to shore facilities near existing grid infrastructure, with remote or local control capabilities in place 24 hours a day. Project turbines are equipped with an electrical brake that can cease power generation and slow turbine rotation within seconds. In the event of loss of transmission and control capabilities, the brake engages automatically.

The District has consulted with public and private parties interested in public safety, including the U.S. Coast Guard, the Puget Sound Pilot's Association, the U.S. Army Corps of Engineers Navigation Division, the Washington Department of Ecology, American Waterways Operators, and the U.S. Navy. No substantive public safety concerns related to the Project have been identified. Nevertheless, the District will engage in detailed Project monitoring so as to be able to detect, respond to, and report conditions potentially hazardous to public safety.

¹ Most of the comments were received informally at meetings attended by various agencies, tribes, and other stakeholders, thus very few written comments are able to be included in the record.

2.1 Project Monitoring

Real-time monitoring information of turbine operations will be transmitted to the Project controls building by the fiber optics or copper wire bundles in the trunk cable. Electronic turbine health and data management capability is integrated into Project controls to ensure the long term viability and structural integrity of the turbines. An integrated sensor approach to turbine management will quickly identify and respond to unusual turbine behavior.

- Electrical – Real-time operational status of each turbine will be monitored by measuring and recording electrical parameters. Automatic alarm thresholds will be set locally with processor control or remotely by maintenance personnel.
- Mechanical – A three axis orthogonal accelerometer will be mounted on the turbine to measure real-time vibration levels in x, y, and z axis. Alarm levels and automatic controls will be set to shut down the turbine at preset acceleration levels to prevent potential turbine damage or internal mechanical or electrical imbalances caused by excessive vibration. An integrated tilt sensor will be mounted to the gravity mount frame to assist in establishing levels and will monitor the turbine for long term settling.
- ROV – A remotely operated vehicle will be used to inspect the turbines and the area in the vicinity of the turbines following installation and on an as needed basis as required by the license. During the first year of deployment, ROV observations are expected every 2-3 months. Following this initial period, the District will deploy an ROV at least twice annually.

Manual control in the Project controls building and remote web-based monitoring and control will be provided for turbine and grid connection functions. Turbine control functions will include grid connection and disconnection and turbine braking if necessary. A computer will manage and display sensor information as it arrives. The program that manages the sensor data collection will also keep historical records, track sensor level thresholds, and perform calculations. The computer will have internet access for remote data displays and commands.

The Control building will have 24-hour fire and security monitoring through a local service provider and the District's 24-hour Energy Control Dispatch.

The turbines will be monitored and controlled using a Programmable Logic Controller (PLC) and Human Machine Interface (HMI) which will transmit live data to a control room. The PLC monitors all turbine critical sensors (temperature, electrical current, voltage, rpm and equipment status) and is set with alarm levels that will inform the Duty Manager in the event of any excursions from normal operation. The Duty Manager can use the same data link to control the turbine load settings in the event of an emergency. The turbine load settings allow the reduction in power generated by the turbine to zero if necessary. The systems are monitored and all critical sensors checked for continuing functionality at least once per week.

Each control component will be subject to evaluation and testing on an annual or more frequent basis.

2.2 Environmental Monitoring

Methods and equipment to be deployed by the District to monitor the environmental conditions of the Project, including monitoring for injury or mortality to any federally listed threatened or endangered species under the Endangered Species Act (ESA) or marine mammal afforded protection under the Marine Mammal Protection Act (MMPA), are described in detailed in various monitoring plans included with the license application. These monitoring plans (collectively, the “Monitoring Plans”) include the Benthic Habitat Monitoring Plan, the Acoustic Monitoring Plan, the Derelict Gear Monitoring Plan, the Near-Turbine Monitoring Plan, the Marine Mammal Monitoring Plan, the Water Quality Plan, and any other monitoring plan filed with the license application or later required by the Commission.

2.3 Emergency Response

Each of the Monitoring Plans has its own requirements for when a hazardous condition is detected and how to respond to that condition. When a hazardous condition occurs that is covered by a Monitoring Plan, the District will implement the response required by that plan.

For hazardous conditions not described in a Monitoring Plan or detected by the monitoring described in this Safeguard Plan, including electronic detections (e.g., by operational parameters moving outside expected ranges), through environmental monitoring equipment (e.g., video cameras), visually, or be reported by other entities, The District will generally evaluate the condition and current operational parameters, and will modify or cease turbine operation until the hazard can be circumvented or resolved.

In rare cases where physical response is required, the District will notify appropriate personnel. For fire and similar events, appropriate personnel will include local fire and police. Response times for District personnel will vary depending on time of day and location of personnel, but physical presence may take several hours given the location of the Project site.

In the event of an extreme emergency requiring the immediate disconnection and removal of the turbines, the removal operation is likely to take 1-2 weeks. Depending on local availability of appropriate vessels, equipment, and crew, an emergency effort could occur quicker or longer.

In the event of an emergency involving subsea equipment, the District will likely utilize a remotely-operated vehicle to inspect the Project facilities prior to making a decision of how to remove or repair the turbine or other Project equipment. The District is currently requesting proposals from local ROV operators with the intent of having an operator who is familiar with the site and available at short notice throughout the entire term of the pilot project deployment. The chosen ROV operator will assist with pre-installation design efforts being undertaken by the District, and thus will have opportunities prior to turbine deployment to become familiar with the site conditions and challenges. As a result, the District expects the timeframe to mobilize an ROV in an emergency to be a matter of days.

Following any detection of a hazardous condition, the District will engage in emergency communications and reporting, as detailed below.

2.4 Emergency Communication and Reporting

Each Monitoring Plan contains communication and reporting protocols which are tailored to the type of hazardous condition detected and the species impacted. When a hazardous condition is detected, the District will implement those protocols, including notifying the members of the Marine Aquatic Resource Committee (comprised primarily of concerned agencies and tribes) (the MARC) and the Portland Regional Engineer, Division of Dam Safety and Inspections within the timelines prescribed in the relevant Monitoring Plan and preparing the required written reports of the condition. The Monitoring Plans also have consultation requirements and procedures intended to aid the District in developing (and ultimately filing with the Commission and implementing) measures to remove the hazardous condition and prevent its future recurrence.

In addition, during an emergency the following agencies will be contacted:

- United States Coast Guard
- Puget Sound Harbor Safety Committee
- Washington State Ferries
- United States Navy
- Island County
- Puget Sound Vessel Traffic Service
- Local police and/or paramedics, depending on nature and location of emergency

The emergency call-out list will be maintained at the District’s Control Center, staffed twenty-four hours per day, seven days per week, and will contain local contact numbers of the agencies referenced above. The District will contact each agency listed above annually to (a) verify that the contact information on the emergency call-out list is accurate, and (b) request a review of the Project and Public Safety Plan and solicit comments on the Plan.

3.0 NAVIGATIONAL SAFETY PLAN

3.1 Overview

The Admiralty Inlet passage is used by essentially all maritime traffic transiting to and from the ports of Seattle, Tacoma, Olympia, and Everett, as well as U.S. Navy facilities including Naval Station Everett, Puget Sound Naval Shipyard, and the Bangor Submarine Base. Additionally, the Port Townsend-Keystone ferry runs between Port Townsend and Keystone Harbor in Admiralty Bay on Whidbey Island. The location of the tidal energy project is near, but well outside of, a regulated and International Maritime Organization established Traffic Separation Scheme (TSS) under U.S. Coast Guard (USCG) Vessel Traffic Service (VTS) control.

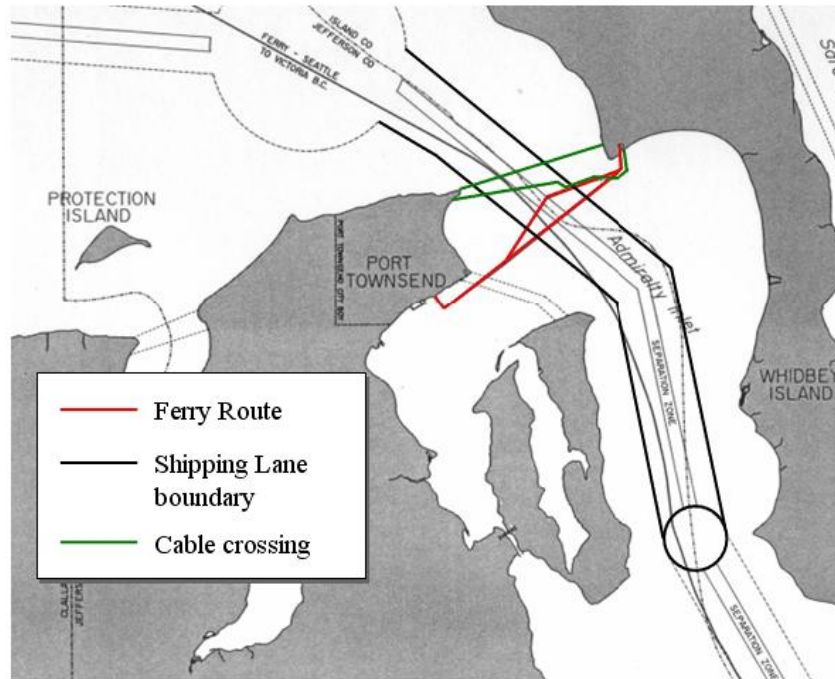


Figure 1. Shipping and ferry lanes in Northern Admiralty Inlet (PSWQA 1992).

Northern Admiralty Inlet has been closed to commercial fishing since 1987 (personal communication, B. Polagye, University of Washington with J. Jordan, WDFW, 2007), though it is within the accustomed fishing areas of several tribes. Recreational anglers use hook and line from piers, the beach at Fort Casey, private vessels, and charter boats (Palsson et al. 1998). Sportfishing for salmon, sturgeon and other marine fish is a popular activity throughout Puget Sound. Fort Casey State Park is located next to the project and includes an underwater marine component. Marine activities in the park include boating, fishing, and diving. Diving within Northern Admiralty Inlet is primarily near shore (Polagye et al. 2007) and is not expected to conflict with the turbine deployment location. The wreck of the SS **GOVERNOR** is occasionally visited by advanced divers; however the wreckage is located well outside of the Project area (3-4 miles to the northwest).

The District has engaged in consultation in regard navigational safety with public and private interested parties, including the US Coast Guard, the Puget Sound Pilot's Association, the U.S. Army Corps of Engineers Navigation Division, the Washington Department of Ecology, the Washington Department of Transportation, regional Marine Resource Committees, the American Waterways Operators (AWO), and the U.S. Navy. The District has conducted a rigorous navigational safety risk assessment for the project and believes that risks to navigational safety are both modest and readily manageable. The complete risk assessment document is appended to the end of this Safeguard Plan.

The Navigation Safety Plan presented here is intended to be consistent with the US Coast Guard's Navigation and Vessel Circular No. 02-07, which provides guidance on Coast Guard policy in regards offshore renewable energy installations. The Circular states in part that navigation risk assessments for such installations should describe the installation's effects on 1) visual navigation and collision avoidance, and 2) communications, radar, and positioning

systems. In addition, the Circular states that a project proponent should describe plans for marine navigational marking of the project and surrounding area. Each of these is discussed below.

The purpose of the Navigation Safety Plan is to protect the public and Project facilities from such events as collisions between commercial and recreational vessels and in-water Project facilities; entanglement of fishing gear, anchors, dredging equipment, or other underwater devices that may damage or become entangled with Project transmission, anchoring, and mooring lines; and electrocution. In the event they occur, any such event will be treated as a public safety hazard to be addressed through the District's Public Safety Plan.

3.2 Possible Navigation Activities that May Impact the Subsea Trunk Cables

The only navigation activities that could potentially impact the subsea trunk cables are dredging activities. Due to the character of the subsea trunk cables (size and weight), anchoring activities by small fishing and recreational boaters are not expected to have any impact. Impacts due to anchoring by large commercial vessels will be minimized through cooperation with the United States Coast Guard.

Dredging activities are not conducted in Admiralty Inlet, nor are such operations necessary. Tidal current speed and turbulent flow keep the channel seafloor free of sediment buildup

Per the Army Corps of Engineers, the only dredging that occurs in Admiralty Bay is sediment clearance for Keystone Harbor and the Keystone ferry landing. The Army Corps constructed Keystone Harbor in 1948. The harbor interrupts movement of sediment from west to east. Sediment builds up in the harbor, and is blocked from accreting on the beach to the east by the jetty. This structure also causes erosion of the beach to the east. The Corps dredges 16,000 to 30,000 cubic yards (CY) from the channel every four to six years (since 1950). The Corps completed dredging in 2006 and most recently in March of 2012 (Army Corps, Seattle District,, 2012-pers. communication, Figure 1). The southern limit of the dredged zone lies well to the north of the proposed cable route and is not expected to place the cables at risk.

Anchoring of either commercial or recreational vessels in Admiralty Inlet is not recommended practice, due to the extreme currents and turbulence through the throat of the inlet (and particularly at the turbine locations and fixed 50-ton anchor sites). The heavy anchor cables connected to the fixed anchors will lie on the seafloor and only be accessible by acoustic release, preventing any unauthorized use of the anchors.

While vessels occasionally do anchor in Admiralty Bay, both the ferry route and the current flow and sea conditions within the bay dictate that most anchoring operations are conducted both farther south and east (bayheadward) from the cable route and are thus unlikely to present a risk to the cables. The beach to the north, beneath which the cableway will be drilled, is frequently open to a south wind and is thus a lee shore, undesirable for close anchorage.

The weight of the cables and current mixing of the finer sediments within the bay should contribute to relatively rapid self-burial of the cables, further reducing their vulnerability to inadvertent snagging.



Figure 1. March 2012 dredged zone for Keystone Harbor (rectangle). Dredged area ends well north of cable run.

3.3 Navigation and Collision Avoidance

Turbine and cable installation, maintenance, and removal will require barge, tug, and personnel vessels to operate in the Project area for periods of up to six days. All such vessels will comply with the International Rules for Preventing Collisions at Sea (COLREGS) in markings and operation. All such vessel operations shall be coordinated with the Puget Sound VTS.

The turbines will be deployed outside of the TSS and ferry routes and will be deployed at sufficient depths to allow for acceptable navigational clearances even for deep draft vessels. Navigational clearances for the installation of a 10-meter diameter OpenHydro turbine are presented in Figure 2 for the 58-meter water depth at Lowest Astronomical Tide measured at the deployment site. The maximum draft for vessels traveling outside the Admiralty Inlet shipping lane is 6 meters (Polagye et al. 2007; personal communication, Richard McCurdy, Puget Sound Pilots, 2007). The maximum device height off the seabed is 15 meters. This will ensure a minimum clearance of 37 meters for passing ships or tug cables (Figure 2). The AWO has noted however that even this clearance level may be of concern relative to the catenary of tug and barge cables under rare, but potential, head-on meeting circumstances. As a result, this was the primary focus of the navigational risk assessment as well as the existing and recommended safeguards and recommended preventive measures described below.

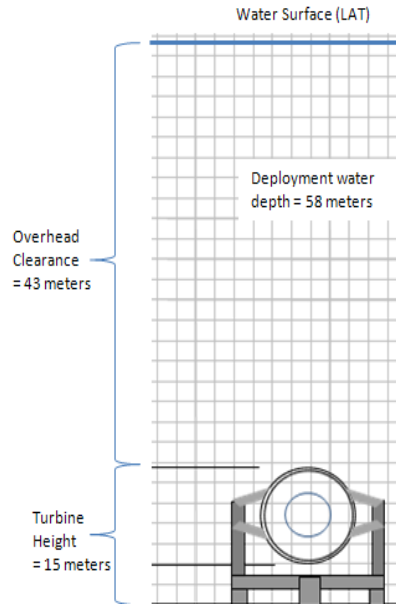


Figure 2. Clearance over installed turbines and turbine foundations.

3.4 Communications, Radar, and Positioning Systems

The Project will be deployed at depth and is not expected to affect any communications, radar, or positioning systems. No concerns regarding these systems have been raised by marine users, the U.S. Navy, or the U.S. Coast Guard.

3.5 Existing Safeguards

VTS

The presence of the U.S. Coast Guard’s Vessel Traffic Service (VTS) in Puget Sound, having the specific duties of monitoring vessel traffic and issuing advisories where appropriate, is a very powerful safeguard against any marine transit accident. VTS effectively monitors, tracks and communicates with all commercial vessel traffic in the Sound, facilitating the secure and efficient flow of maritime commerce and ensuring that potential incidents are not permitted to develop into hazardous situations. Recognition of a tow vessel’s need for early warning of opposing traffic and an understanding of the unique hazards specific to the Admiralty Inlet operating area are critical watchstander skills needed to help prevent the hazardous situations described in the risk assessment from developing.

Reduction of Towline Scope

In the event of a necessary or unexpected reduction in speed, towing vessels have the option of taking up on the span of tow cable in the water, even to the point of bringing the towed barge or vessel alongside temporarily if required. Even in the event vessel power is lost, emergency power is normally available at the tow winch, permitting the towline to be brought in.

Anchor

As a last resort, if the vessel is adrift and no assistance is immediately available, the vessel master may make both anchors ready for letting go and prepare to anchor at closest anchorage or moor at nearest harbor of safe refuge upon direction of the Captain of the Port.

3.6 Recommendations for Additional Preventive Measures

Regulated Navigation Area (RNA)

In order to preclude the potential for development of a hazardous navigation situation, the District engaged in discussions with the United States Coast Guard regarding the need for establishment of a regulated navigation area (RNA) (as part of this effort, the District submitted a request for establishment of an RNA in writing to the Captain of the Port, Sector Puget Sound as provided under Subpart A of 33 CFR 165, paragraph 5(b)). Through these discussions, the District and the United States Coast Guard concluded that an RNA would not be initially required. The United States Coast Guard, however, reserved the right to revisit the need for an RNA following deployment of the turbines and experience with managing the impact on navigation without an RNA. If necessary, the United States Coast Guard has reserved the right to require an RNA for the Project at a future time.

VTS Monitoring of Tugs in Test Area

VTS authority exists to control vessel traffic during conditions of vessel congestion or other hazardous circumstances. No additional monitoring requirements should be necessary.

Tug and tow avoidance of peak tidal flow zone

The project is sited directly in the peak tidal flow where turbulence is at a maximum and vessel steering control at a minimum. It seems reasonable to suggest that shiphandling – particularly when transiting with the current – would be significantly easier and safer along a track that avoids the peak flow axis for Admiralty Inlet. A trackline farther offshore from Admiralty Head would be advantageous to reducing turbulence, particularly during the tidal ebb. One of the comments made by a towing industry representative in an early meeting to discuss AWO's concerns mentioned the turbulence in the area and its impact on vessel control.

Tug and tow avoidance of opposing TSS lane

Regulations prohibit vessels from transiting the wrong direction in a TSS, as it is in violation of the Navigation Rules. A southbound tug and tow in a meeting situation with a northbound tug and tow, if required to alter course, should avoid entering the northbound TSS lane unless as a last resort to avoid an imminent collision or close aboard situation. If possible, the northbound vessel should alter course to the west toward or into the northbound TSS lane so as to give the southbound vessel seaway to the east of that lane.

3.7 Ongoing Consultation with the United States Coast Guard

The District will contact the United States Coast Guard at least annually to discuss whether current safety procedures remain sufficient to protect navigational interests and, if not, what additional safety precautions will be undertaken. The District will also review the Navigational

Safety Plan with the United States Coast Guard following any navigation safety issue that may arise during installation, operation, or decommissioning of the Project.

To the extent any additional safety precautions require Commission approval prior to implementation, the District will seek such approval by filing the necessary documents with the Commission. Upon Commission approval, the District will implement the additional safety precautions.

3.8 Summary

Vessel tracking statistics from over one year of Automatic Information System (AIS) monitoring provided as Attachment 1 in the risk assessment document indicate that the frequency of head-on meetings between two towing vessels in the area west of Admiralty Head (i.e., within area 2 miles long by 0.75 mile wide) near the proposed tidal energy test site is less than one occurrence per month. Given the presence in Puget Sound of USCG's VTS, a unit with an exceptional record of safety, it is difficult to envision a scenario in which advance coordination between VTS and towing vessels moving through the test site could not easily accomplish a safe passage with sea room to spare. The risk assessment also indicates that traffic in the northbound TSS lane east of the site is easily sparse enough that in most cases a small diversion of the northbound tow vessel nearer to or even across the boundary into the lane would not be likely to cause any restriction of faster-moving commercial traffic in the system. Overtaking situations between tugs operating with tows are slow enough to develop that VTS monitoring and coordination should easily preclude the necessity for close passage of two vessels in the vicinity of the tidal energy pilot project site.

Based on the observed one head-on encounter each month in the area of concern, we believe that the risk of the project to tugs and tows is easily manageable, and that required monitoring will not cause an undue burden on VTS watchstanders.

4.0 EMERGENCY SHUTDOWN PLAN

Through its Project controls and environmental and Project monitoring efforts, as described in more detail in the Monitoring Plans, the District will monitor for unusual or unsafe Project conditions or operating parameters, including Project-related conditions likely associated with unauthorized injury or mortality to ESA-listed species or species protected under the MMPA, as well as incidents or conditions representing hazards to public safety. In certain circumstances identified in each of the Monitoring Plans, or if ordered by the Portland Regional Engineer, Division of Dam Safety and Inspections, Project shutdown may be required. The following provisions describe the procedures to be taken when shutdown is required.

Emergency shutdown procedures will consist of the following:

- The electrical brake will be engaged on the unit(s). The electrical brake is capable of effectively ceasing turbine rotation within approximately one second, and generation ceases in this time as well.
- The subsea systems will be electrically isolated from the grid.

- The District will implement these measures remotely from either the control center or the shore station. The District will describe these measures in the above referenced written report to be filed with FERC, agencies and Tribes.

Each of the Monitoring Plans contains notice and consultation provisions following an event that requires one or both turbines to be shut down. The District will provide the notice and engage in the consultation required in each of these plans.

5.0 PROJECT REMOVAL AND SITE RESTORATION PLAN

One or both turbines may be removed in order to perform maintenance or repairs, and reinstalled once maintenance and repairs are complete. Further, as required by FERC’s pilot project guidance, the Project will be removed, and all restoration activities completed, prior to the end of the license term unless a new license is obtained. The District will determine whether to pursue a new license based on the monitoring and operational results of the pilot Project.

In addition, one or more Monitoring Plans may require Project removal following assessment of situations that prompt emergency shutdown.

5.1 Turbine and Foundation

Project turbines and foundations will be removed by reversing the installation process. The OpenHydro Installer barge will be transported to Project area waters, anchored, and the turbines winched to the surface for transport to shore. Because the turbines are not fixed or anchored to the seafloor, the process is straightforward and requires little to no site disturbance. As with the installation process, turbine removal is completed within one tidal cycle.

The following vessels are required, under typical circumstances, to recover the OpenHydro turbines:

- OpenHydro Installer barge;
- Tug(s) with 20 metric tons or greater rated bollard pull; and
- Personnel transfer/safety boat.

Additional vessels or equipment may be required, depending on the time of year removal is conducted, the condition of the turbines at the time of removal, and the availability of the vessels listed above.

The turbine system is designed such that each turbine can be raised without disturbing the other turbine. Slack service cabling provides for removal of either turbine to the surface. Lifting cables from the barge will be attached to the subsea base in-situ using a specialized turbine recovery tool which has been designed and built by OpenHydro. The turbines will be electrically disconnected and disabled on-site. Once secured to the barge, the turbine and foundation be towed to a suitable dockside location where the turbine would be removed from the subsea base for maintenance. A dockside location has not yet been selected for unloading the turbines for refurbishment, though a number of suitable facilities occur in Puget Sound. It is anticipated that

the majority of the maintenance and repair work would be carried out at an operations base situated locally to the site and using locally employed labor.

5.2 Cable Abandonment or Removal

Transmission cables will be assessed by ROV during operation and at the completion of the Project. Prior to removal of the Project the District will consult with state and federal resource agencies and other interested parties to determine whether the subsea cables should be left in place and abandoned to avoid further sea floor disturbance from removal or whether they should be removed. The District's consultations will include the development of an appropriate abandonment or removal plan and, upon acceptance by the agencies and other parties involved, the District will implement that plan.

5.3 Shore-Based Facilities

In the event of Project removal, the District will remove all equipment according to the terms of the agreement(s) between the District and the owner of the private property on which the terrestrial equipment will be constructed. The District will remove all terrestrial transmission line and other equipment according to the terms of the agreement(s) between the District and Puget Sound Energy.

5.4 Implementation Schedule

The removal and restoration activities described in this section 5 will begin no later than two (2) months prior to expiration of the pilot license, unless a new license has been obtained from the Commission. In order to meet this timeframe, the District must begin its contracting process several months prior, depending on the projected availability of the vessels, equipment, and personnel necessary to remove the turbines and perform the necessary site restoration activities. Because several removal and restoration activities will be determined based on the condition of the site and equipment at the time of removal (e.g., the subsea cable), a detailed scope of work cannot be completed at the time the pilot license application is filed. The District will, however, consult with the MARC when developing the scope of work to be used for the removal and restoration activities prior to initiating the contracting process.

6.0 REFERENCES

Palsson, W. A., W., T. Northup, and M. Barker. 1998. Puget Sound groundfish management plan (revised).

Polagye, Brian, Mirko Previsic, and Roger Bedard. 2007. Tidal In-Stream Conversion (TISEC): Survey Characterization of SnoPUD Project Sites in Puget Sound. EPRI North American Tidal Flow Power Feasibility Demonstration Project. EPRI-TP-003-WA. May 30, 2007.

Puget Sound Water Quality Authority (PSWQA). 1992. Update of the Puget Sound environmental atlas. Seattle, WA.

Title 33: Navigation and Navigable Waters

PART 165 – REGULATED NAVIGATION AREAS AND LIMITED ACCESS AREAS

Subpart A -- General

§165.5 Establishment procedures.

(a) A safety zone, security zone, or regulated navigation area may be established on the initiative of any authorized Coast Guard official.

(b) Any person may request that a safety zone, security zone, or regulated navigation area be established. Except as provided in paragraph (c) of this section, each request must be submitted in writing to either the Captain of the Port or District Commander having jurisdiction over the location as described in Part 3 of this chapter, and include the following:

(1) The name of the person submitting the request;

(2) The location and boundaries of the safety zone, security zone, or regulated navigation area;

(3) The date, time, and duration that the safety zone, security zone, or regulated navigation area should be established;

(4) A description of the activities planned for the safety zone, security zone, or regulated navigation area;

(5) The nature of the restrictions or conditions desired; and

(6) The reason why the safety zone, security zone, or regulated navigation area is necessary.

(c) Safety Zones and Security Zones. If, for good cause, the request for a safety zone or security zone is made less than 5 working days before the zone is to be established, the request may be made orally, but it must be followed by a written request within 24 hours.

(Requests for safety zones, security zones, and regulated navigation areas are approved by the Office of Management and Budget under control number 1625–0020)

[CGD 79–034, 47 FR 29660, July 8, 1982, as amended by CGD 79–026, 48 FR 35408, Aug. 4, 1983; USCG–2006–25150, 71 FR 39211, July 12, 2006]

Subpart B—Regulated Navigation Areas

§165.10 Regulated navigation areas.

A regulated navigation area is a water area within a defined boundary for which regulations for vessels navigating within the area have been established under this part.

§165.11 Vessel operating requirements (regulations).

Each District Commander may control vessel traffic in an area which is determined to have hazardous conditions, by issuing regulations:

- (a) Specifying times of vessel entry, movement, or departure to, from, within, or throughports, harbors, or other waters;
- (b) Establishing vessel size, speed, draft limitations, and operating conditions; and
- (c) Restricting vessel operation, in a hazardous area or under hazardous conditions, to vessels which have particular operating characteristics or capabilities which are considered necessary for safe operation under the circumstances.

§165.13 General regulations.

- (a) The master of a vessel in a regulated navigation area shall operate the vessel in accordance with the regulations contained in Subpart F.
- (b) No person may cause or authorize the operation of a vessel in a regulated navigation area contrary to the regulations in this part.

ATTACHMENT 2 – VESSELS PASSING WITHIN A 200M RADIUS OF PROPOSED TURBINE SITE (92 TOTAL IN 2010)

Vessel MMSI	Time of Passage	Direction	Vessel Name	Vessel Type
367408890	'Apr 03 2010 12:36'	'S'	ANNE CARLANDER	Tug/Towing
303398000	'Apr 04 2010 11:45'	'S'	TAURUS	Tug/Towing
367153930	'Aug 06 2010 07:41'	'S'	STEILACOOM 2	Ferry
366980220	'Aug 11 2010 11:10'	'S'	ALYSSA ANN	Tug/Towing
367408890	'Aug 12 2010 11:19'	'S'	ANNE CARLANDER	Tug/Towing
367010430	'Aug 15 2010 12:29'	'S'	JENNIFER H	Tug/Towing
367374350	'Aug 17 2010 19:14'	'S'	R/V Jack Robertson	Research
367444560	'Aug 20 2010 09:55'	'S'	RELISH	? 6m x 20m
366751770	'Aug 21 2010 19:04'	'S'	BILLIE H	Tug/Towing
367317770	'Aug 22 2010 14:26'	'N'	ELLIS BRUSCO	Tug/Towing
366893620	'Aug 22 2010 19:46'	'N'	CALEB	Tug/Towing
366695810	'Aug 25 2010 07:53'	'S'	WESTRAC II	Tug/Towing
366866930	'Aug 31 2010 20:33'	'N'	RESPONSE	Tug/Towing
367083650	'Dec 04 2010 17:26'	'S'	HARVESTOR	Fishing
367408890	'Dec 07 2010 21:05'	'S'	ANNE CARLANDER	Tug/Towing
366866930	'Dec 11 2010 19:52'	'S'	RESPONSE	Tug/Towing
366751770	'Dec 19 2010 18:15'	'S'	BILLIE H	Tug/Towing
303442000	'Dec 21 2010 12:02'	'S'	HERCULES	Tug/Towing
367408890	'Dec 21 2010 21:03'	'S'	ANNE CARLANDER	Tug/Towing
367153930	'Feb 02 2010 13:36'	'N'	STEILACOOM 2	Ferry
366887970	'Feb 03 2010 12:09'	'S'	PROTECTOR	Tug/Towing
366980170	'Feb 04 2010 00:50'	'S'	PACIFIC	Tug/Towing
367374350	'Feb 10 2010 17:46'	'N'	R/V Jack Robertson	Research
338033478	'Feb 16 2010 12:26'	'N'	BERING	Fishing

Vessel MMSI	Time of Passage	Direction	Vessel Name	Vessel Type
316006374	'Feb 16 2010 21:29'	'N'	WEE HAUL	Tug/Towing
367083650	'Feb 18 2010 21:26'	'S'	HARVESTOR	Fishing
366972050	'Feb 24 2010 06:12'	'N'	SWINOMISH	Tug/Towing
367408890	'Feb 25 2010 04:50'	'S'	ANNE CARLANDER	Tug/Towing
367103880	'Jan 05 2010 11:26'	'S'	TRIUMPH	Tug/Towing
366751770	'Jan 26 2010 16:03'	'S'	BILLIE H	Tug/Towing
367408890	'Jan 28 2010 19:42'	'S'	ANNE CARLANDER	Tug/Towing
366751770	'Jul 01 2010 20:41'	'N'	BILLIE H	Tug/Towing
303362000	'Jul 07 2010 19:01'	'S'	PACIFIC STAR	Tug/Towing
367408890	'Jul 09 2010 20:20'	'S'	ANNE CARLANDER	Tug/Towing
366751770	'Jul 10 2010 07:07'	'S'	BILLIE H	Tug/Towing
303442000	'Jul 12 2010 10:57'	'N'	HERCULES	Tug/Towing
319193000	'Jul 12 2010 18:16'	'N'	VANGO	Pleasure
367145330	'Jul 14 2010 12:35'	'S'	FALCON	Tug/Towing
366918910	'Jul 21 2010 11:10'	'N'	CLIFFORD A BARNES	Research
367001680	'Jul 24 2010 04:07'	'S'	VULCAN	Tug/Towing
303297000	'Jul 26 2010 09:09'	'S'	UNKNOWN	?
367367880	'Jul 28 2010 10:23'	'N'	ONLINE	Pleasure
366993250	'Jul 30 2010 11:49'	'S'	REDWOOD CITY	Tug/Towing
366980170	'Jul 31 2010 11:00'	'S'	PACIFIC	Tug/Towing
367070410	'Jun 10 2010 18:06'	'N'	LUTHER	Tug/Towing
303362000	'Jun 10 2010 21:26'	'S'	PACIFIC STAR	Tug/Towing
367145330	'Jun 12 2010 02:08'	'N'	FALCON	Tug/Towing
367114810	'Jun 19 2010 06:20'	'N'	VICTORIOUS	Pleasure
366893620	'Jun 21 2010 02:53'	'N'	CALEB	Tug/Towing
366993250	'Jun 21 2010 12:01'	'N'	REDWOOD CITY	Tug/Towing

Vessel MMSI	Time of Passage	Direction	Vessel Name	Vessel Type
366740920	'Jun 21 2010 17:14'	'N'	SHANNON	Tug/Towing
366993810	'Jun 22 2010 05:44'	'N'	WASP	Tug/Towing
303362000	'Jun 24 2010 06:40'	'N'	PACIFIC STAR	Tug/Towing
367131890	'Jun 30 2010 17:50'	'N'	VAERDAL	?
367103880	'Mar 03 2010 08:59'	'S'	TRIUMPH	Tug/Towing
368631000	'Mar 08 2010 13:38'	'N'	CAPE CAUTION	Tug/Towing
366993810	'Mar 10 2010 15:57'	'N'	WASP	Tug/Towing
316005498	'Mar 15 2010 18:12'	'S'	SEASPAN COMMANDER	Tug/Towing
367408890	'Mar 18 2010 22:26'	'S'	ANNE CARLANDER	Tug/Towing
366764740	'Mar 19 2010 10:22'	'S'	CHIEF	Tug/Towing
366751770	'Mar 21 2010 11:53'	'S'	BILLIE H	Tug/Towing
303398000	'Mar 21 2010 12:51'	'S'	TAURUS	Tug/Towing
367579000	'Mar 30 2010 09:04'	'S'	WESTERN RANGER	Tug/Towing
367374350	'May 06 2010 06:10'	'N'	R/V Jack Robertson	Research
367001680	'May 06 2010 17:50'	'N'	VULCAN	Tug/Towing
367408890	'May 10 2010 18:44'	'S'	ANNE CARLANDER	Tug/Towing
0	'May 12 2010 12:04'	'N'	Glitch	?
366751770	'May 15 2010 08:07'	'S'	BILLIE H	Tug/Towing
366811310	'Nov 01 2010 15:19'	'S'	JAMES T QUIGG	Tug/Towing
366345000	'Nov 02 2010 00:40'	'N'	THOMAS G THOMPSON	UNOLS Research
367083650	'Nov 02 2010 17:08'	'S'	HARVESTOR	Fishing
366866930	'Nov 03 2010 10:34'	'N'	RESPONSE	Tug/Towing
369514000	'Nov 06 2010 07:48'	'S'	GULF TITAN	Tug/Towing
367083650	'Nov 06 2010 20:01'	'N'	HARVESTOR	Fishing
367153930	'Nov 07 2010 19:08'	'S'	STEILACOOM 2	Ferry
367374350	'Nov 08 2010 11:05'	'N'	R/V Jack Robertson	Research

Vessel MMSI	Time of Passage	Direction	Vessel Name	Vessel Type
367083650	'Nov 09 2010 21:54'	'S'	HARVESTOR	Fishing
367374350	'Nov 10 2010 07:13'	'S'	R/V Jack Robertson	Research
367083650	'Nov 23 2010 22:00'	'S'	HARVESTOR	Fishing
366994760	'Oct 02 2010 21:37'	'N'	ALISON S	ROV Survey
366757740	'Oct 27 2010 12:51'	'S'	PETER M	Tug/Towing
367313410	'Oct 29 2010 13:19'	'S'	WINDFLIGHT	Pleasure
367153930	'Sep 05 2010 18:37'	'N'	STEILACOOM 2	Ferry
366918910	'Sep 08 2010 15:54'	'N'	CLIFFORD A BARNES	Research
366623050	'Sep 09 2010 22:14'	'S'	KIRSTEN H	Tug/Towing
367103880	'Sep 10 2010 04:59'	'S'	TRIUMPH	Tug/Towing
366980220	'Sep 12 2010 16:53'	'N'	ALYSSA ANN	Tug/Towing
303442000	'Sep 17 2010 14:57'	'S'	HERCULES	Tug/Towing
366740920	'Sep 18 2010 20:29'	'N'	SHANNON	Tug/Towing
366751770	'Sep 19 2010 17:31'	'S'	BILLIE H	Tug/Towing
366893620	'Sep 22 2010 18:46'	'N'	CALEB	Tug/Towing
366994760	'Sep 29 2010 13:03'	'N'	ALISON S	ROV Survey