



ATLANTIS
RESOURCES CORPORATION

Environmental Monitoring Report

EMEC AK-1000

This report details the findings of the environmental monitoring of the AK-1000, 1MW tidal turbine

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14/09/2011

COMMERCIAL IN CONFIDENCE

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1 INTRODUCTION

1.1 Outline

Atlantis spent the summer of 2011 installing and commissioning the AK-1000 tidal turbine.

1.2 Aim

This document provides a summary of the activity on the turbine site over the summer period and details the finding of the environmental monitoring of the AK-1000 tidal turbine.

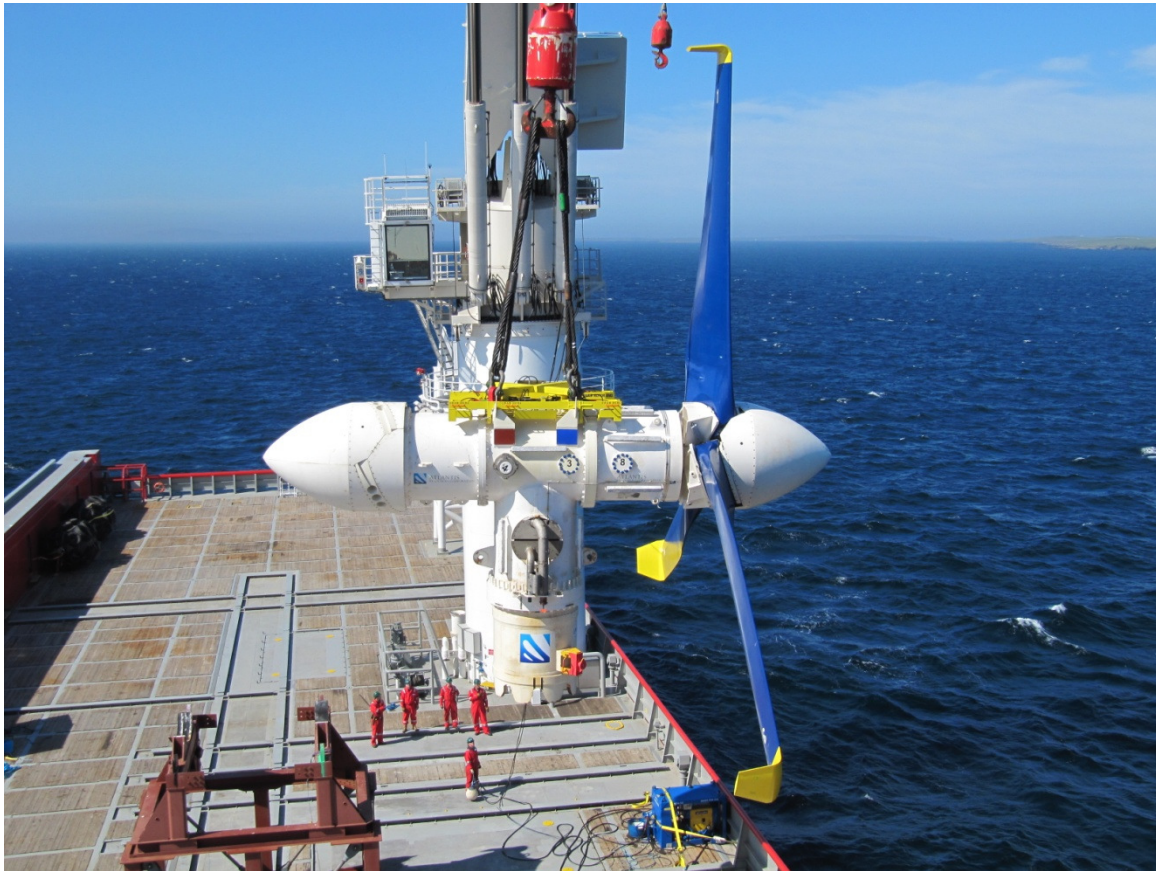


Photo 1 Nacelle installation from Aker Wayfarer

2 SUMMARY OF ACTIVITY

Since recovering the turbine last year the device was prepared with a new set of rotor blades and was initially installed on May 9th. Shortly afterwards the device was electrically connected to the subsea cable by diver intervention. Over the course of the summer the team worked through a number of challenges in order to complete the commissioning of the turbine. Table 1 lists the activity carried out over this period.

ID	Date	Event	Comment
1.	23 – 25 Apr	Connection of Cable Management System to subsea cable	By class II DP vessel, VOLANTIS
2.	9 May	Nacelle installed	By class II DP vessel, Aker WAYFARER
3.	24 – 29	Nacelle electrical connection	By diver intervention from MV USKMOOR

	May		
4.	22 – 27 Jun	Nacelle electrical disconnection	By diver intervention from MV USKMOOR
5.	9 Jul	Nacelle recovery	By class II DP vessel, Olympic ZEUS
6.	10 – 21 Jul	Maintenance work on Hatston Pier	An electrical fault was resolved
7.	22 Jul	Nacelle installed	By class II DP vessel, BOA DEEP C
8.	23 – 27 July	Nacelle electrical connection	By diver intervention from MV USKMOOR
9.	27 Jul – 13 Sep	Turbine commissioning	Commissioning team tested each of the systems. The turbine was spun briefly on a number of occasions
10.	4 – 6 Sep	Cleaning of camera and ADCPs	By diver intervention from MV USKMOOR

Table 1 Summary of activity

3 SUMMARY OF OPERATIONAL PERIODS

During the commissioning the turbine was spun on the following occasions.

ID	Date	Time On	Time Off	Comment
1.	11/9/2011	11:30	12:30	Active Brake simulation
2.	11/9/2011	18:15	19:20	Active Brake simulation
3.	12/9/2011	13:00	13:10	Active Brake simulation
4.	13/9/2011	08:17	08:22	Active Brake simulation

Table 2 Turbine operation periods

4 MARINE MAMMAL OBSERVATION

Over the summer period Atlantis has visited the site with a DP vessel on 4 separate occasions. On each occasion a MMO was employed to observe the site from a vantage point on Eday, in accordance with the Marine Mammal Protocol, '3004-ARC-ER-021-MMOProtocol 1.3'. For the operations on the 9th and 22nd July a second Marine Mammal observer was employed to monitor the immediate vicinity of the vessel during DP operations. This additional requirement was stipulated in an email from Leeanne Mullan on the 7th July.

No marine mammals were spotted during any of the DP operations. The MMO Reports are shown in Annex A

ID	Date	MMO	MMO Position	Vessel	Comment
1.	23/04/11	Mike Cockram	Eday	VOLANTIS	No sightings
2.	09/05/11	Adam Cockram	Eday	AKER WAYFARER	No sightings
3.	09/07/11	Mike Cockram	Eday	OLYMPIC ZEUS	No sightings
4.	09/07/11	Jon Csehi	Vessel	OLYMPIC ZEUS	No sightings
5.	22/07/11	Mike Cockram	Eday	BOA DEEP C	No sightings
6.	22/07/11	Sam Blakburn	Vessel	BOA DEEP C	No sightings

Table 3 Summary of Marine Mammal Observation Reports

5 ACOUSTIC MONITORING

The turbine has not been operational for long enough to be able to gain any worthwhile acoustic monitoring.

6 SEA BED SURVEY

A sea bed survey report for the site pre-installation was issued on the 7th June (A-30333-S03-REPT-001-A01[1]-SeaBedSurveyReport). A further sea bed survey will be carried out on the site in November.

7 COLLISION MONITORING

The brief operating periods did not provide the team with sufficient time to calibrate the collision monitoring system. As a result Atlantis was unable to gain any collision monitoring information from the turbine. Photo 2 shows a still frame taken from the turbine camera.



Photo 2 Taken from turbine camera

ANNEX A. MARINE MAMMAL OBSERVATION REPORTS

-MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS, EFFORT & ENVIRONMENT

Ship		Volantis			Client		Atlantis		
Contractor					Observer		Mike Cockram		
Date	Time when search for marine mammals began	Phase of Work: P= Pre-Operational O=Operational	Wind force (Beaufort) and direction	Sea State: G=Glassy S=Slight C=Choppy R=Rough	Swell: O=Low (0-2m) M=Medium (2-4m) L=Large (>4m)	Visibility: P=Poor (<1km) M=Moderate(1-5km) G=Good (>5km)	Time when search for marine mammals ended	Summary of marine mammals seen	
23/04/2011	06:45hrs	P	2SE	S	O	M	07:00hrs	NONE	
23/04/2011	07:15hrs	In Position	2SE	O	O	M	07:15	NONE	
23/04/2011	08:00hrs	In Position	2SE	O	O	M	08:45	NONE	

MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS, EFFORT & ENVIRONMENT

Ship	Aker Wayfarer			Client	Atlantis			
Contractor				Observer	Adam Cockram			
Date	Time when search for marine mammals began	Phase of Work: P= Pre-Operational O=Operational	Wind force (Beaufort) and direction	Sea State: G=Glassy S=Slight C=Choppy R=Rough	Swell: O=Low (0-2m) M=Medium (2-4m) L=Large (>4m)	Visibility: P=Poor (<1km) M=Moderate(1-5km) G=Good (>5km)	Time when search for marine mammals ended	Summary of marine mammals seen
09/05/2011	06:30hrs	P	3SE	S	O	P	06:45hrs	NONE
09/05/2011	06:45hrs	P	2SE	S	O	M	07:00hrs	NONE
09/05/2011	07:00hrs	P	2SE	S	O	M	07:15hrs	NONE
09/05/2011	07:15hrs	In Position	2SE	S	O	M	07:30hrs	NONE

MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS, EFFORT & ENVIRONMENT

Ship	Olympic Zeus			Client	Atlantis			
Contractor				Observer	Mike Cockram (Land Based)			
Date	Time when search for marine mammals began	Phase of Work: P= Pre-Operational O=Operational	Wind force (Beaufort) and direction	Sea State: G=Glassy S=Slight C=Choppy R=Rough	Swell: O=Low (0-2m) M=Medium (2-4m) L=Large (>4m)	Visibility: P=Poor (<1km) M=Moderate(1-5km) G=Good (>5km)	Time when search for marine mammals ended	Summary of marine mammals seen
09/07/2011	03:45hrs	P	1 ESE	S	O	P	04:00hrs	NONE
09/07/2011	04:00hrs	P	1 ESE	S	O	M	04:15hrs	NONE
09/07/2011	04:15hrs	P	1 ESE	S	O	M	04:30hrs	NONE
09/07/2011	04:30hrs	P	1 ESE	S	O	P	04:45hrs	NONE
09/07/2011	04:45hrs	P	1 ESE	S	O	P	05:00hrs	NONE
09/07/2011	05:00hrs	In Position	1 ESE	S	O	P *	05:15hrs	NONE

* Sea mist closing in

-MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS, EFFORT & ENVIRONMENT

Ship	Olympic Zeus			Client	Atlantis			
Contractor	Mojo Maritime			Observer	Jon Csehi (Vessel Based)			
Date	Time when search for marine mammals began	Phase of Work: P= Pre-Operational O=Operational	Wind force (Beaufort) and direction	Sea State: G=Glassy S=Slight C=Choppy R=Rough	Swell: O=Low (0-2m) M=Medium (2-4m) L=Large (>4m)	Visibility: P=Poor (<1km) M=Moderate(1-5km) G=Good (>5km)	Time when search for marine mammals ended	Summary of marine mammals seen
09/07/11	04:00hrs	P	1 SW	G	O	P	04:30hrs	NONE
09/07/11	04:30hrs	On location DP trials	1 SW	G	O	P	07.00hrs	NONE
09/07/11	07:17hrs	Leaving site	1 SW	G	O	M	07:17hrs	NONE

MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS, EFFORT & ENVIRONMENT

Ship	Boa Deep C			Client	Atlantis			
Contractor				Observer	Mike Cockram (Land Based)			
Date	Time when search for marine mammals began BST	Phase of Work: P= Pre-Operational O=Operational	Wind force (Beaufort) and direction	Sea State: G=Glassy S=Slight C=Choppy R=Rough	Swell: O=Low (0-2m) M=Medium (2-4m) L=Large (>4m)	Visibility: P=Poor (<1km) M=Moderate(1-5km) G=Good (>5km)	Time when search for marine mammals ended BST	Summary of marine mammals seen
22.07.2011	05:45hrs	P	3NNE	S	O	G	06:00hrs	NONE
22.07.2011	06:00hrs	P	3NNE	S	O	G	06:15hrs	NONE
22.07.2011	06:15hrs	P	3NNE	S	O	G	06:30hrs	NONE
22.07.2011	06:30hrs	P	3NNE	S	O	G	06:45hrs	NONE
22.07.2011	06:45hrs	P	2NNE	S	O	G	07:00hrs	NONE
22.07.2011	07:00hrs	P	2NNE	S	O	G	07:15hrs	NONE
22.07.2011	07:15hrs	P	3NNE	S	O	G	07:30hrs	NONE
		Approaching						



22.07.2011	07:30hrs	Site Warness	3NNE	S	O	G	07:45	NONE
22.07.2011	07:45hrs	On Site	3NNE	S	O	G	08:00hrs	NONE
22.07.2011	08:00hrs	On Site	3NNE	S	O	G	08:15hrs	NONE
22.07.2011	08:15hrs	On Site	3NNE S	S	O	G	08:30hrs	NONE

MARINE MAMMAL RECORDING FORM – RECORD OF OPERATIONS, EFFORT & ENVIRONMENT

Ship	Boa Deep C			Client	Atlantis			
Contractor				Observer	Sam Blackburn (Vessel Based)			
Date	Time when search for marine mammals began BST	Phase of Work: P= Pre-Operational O=Operational	Wind force (Beaufort) and direction	Sea State: G=Glassy S=Slight C=Choppy R=Rough	Swell: O=Low (0-2m) M=Medium (2-4m) L=Large (>4m)	Visibility: P=Poor (<1km) M=Moderate(1-5km) G=Good (>5km)	Time when search for marine mammals ended BST	Summary of marine mammals seen
22.07.2011	07:30hrs	OnSite	3NNE	S	O	G		NONE
22.07.2011	08:00hrs	O	3NNE	S	O	G		NONE
22.07.2011	08:30hrs	O	3NNE	S	O	G		NONE
22.07.2011	09:00hrs	O	3NNE	S	O	G		NONE
22.07.2011	09:30hrs	O	2NNE	S	O	G		NONE
22.07.2011	10:00hrs	O	2NNE	S	O	G		NONE
22.07.2011	10:30hrs	O	2NNE	S	O	G		NONE

22.07.2011	11:00hrs	O	2NNE	S	O	G		NONE
22.07.2011	11:30hrs	O	2NNE	S	O	G		NONE
22.07.2011	12:00hrs	O	2NNE	S	O	G		NONE
22.07.2011	12:30hrs	O	3NNE	S	O	G		NONE
22.07.2011	13:00hrs	O	3NNE	S	O	G		NONE
22.07.2011	12:30hrs	O	3NNE	S	O	G		NONE
22.07.2011	14:00hrs	O	4NNE	S	O	G		NONE
22.07.2011	14:30hrs	O	3NNE	S	O	G		NONE
22.07.2011	15:00hrs	O	3NNE	S	O	G		NONE
22.07.2011	16:00	O Dep Site	3NNE	S	O	G	16:15	NONE