

POWER

Units 10 & 11 Dr. John P. Cise, Professor of Physics, Austin Com. College, 1212 Rio Grande

St., Austin Tx. 78701 jpcise@austincc.edu & New York Times December 8, 2016 by John Clarke

South African Sets Out to Paddle Across the Atlantic



INTRODUCTION: The average athletic male produces 400 Watts of power. He alternates between resting and paddling every two to three hours (see below). We will assume he paddles 14 hrs./day. The goal here is to find the average force he exerts on water with the paddle (and thus the reaction force of water on paddle causing the boat to move forward).

QUESTIONS: (a) Find average miles paddled/day. If he goes 4600 miles in four months?, (b) Paddling 14 hrs./day what speed is his paddleboard going at while paddling?, (c) Convert mph speed in (b) to meters/s.?, (d) Find average force (in N.) per paddle stroke?, (e) Find force (d) in pounds?

Chris Bertish off the coast of Morocco on Tuesday. **(((He plans to make a 4,600-mile, open-ocean passage)))** unsupported and unassisted in his 20-foot craft. Listening to the music of Johnny Clegg on speakers mounted to his custom-built craft, the South African Chris Bertish began his attempt to be the first person to cross the Atlantic Ocean on a stand-up paddleboard on Tuesday morning, gliding out of the Agadir Marina of Morocco, on the northwest coast of Africa, shortly before sunrise. **"I've been hearing that I'm nuts all my life, and I wouldn't want it any other way," Bertish said** in a phone interview before he departed on the solo voyage. Bertish, 42, a sailor and big-wave surfer who won the renowned Mavericks surf contest in Northern California in 2010, plans to **(((make the 4,600 mile, open-ocean passage unsupported and unassisted on a 20-foot stand-up paddleboard. He expects it to take four months.)))** He had been waiting weeks in Morocco for the perfect window of weather conditions to begin, and on Tuesday, he concluded that it had arrived. Hoping to use the tides and weather conditions to his benefit, **Bertish plans to paddle about 30 miles a day** — mostly at night, to avoid exposure to the sun — for more than 120 days. On a typical day, Bertish said, **he will alternate between resting and paddling every two or three hours.** He will continuously hydrate and will nourish himself with protein shakes, freeze-dried meals with endurance additives, and salty jerky to replenish the electrolytes he will lose through sweating.

HINTS: 30 days/month, 1609 m./mile, 1 hour/3600 seconds, Power = force x velocity, $P = F v$, 4.448 N./lb.

ANSWERS: (a) ~ 38,33 miles/day, (b) ~ 2.738 mph, (c) ~ 1.2237 m./s., (d) 326.9 N/stroke, (e) ~ 73.5 lb.

COMMENT: A paddle stroke force of ~ 74 lb. seems quite reasonable 14 hrs./day, with ten hours rest/day.