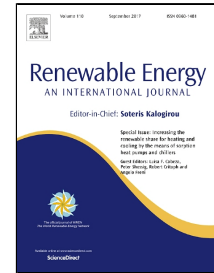


Accepted Manuscript

Analysis of electrical drive speed control limitations of a power take-off system for wave energy converters



José F. Gaspar, Mojtaba Kamarlouei, Ashank Sinha, Haitong Xu, Miguel Calvário, François-Xavier Faÿ, Eider Robles, C. Guedes Soares

PII: S0960-1481(17)30479-2
DOI: 10.1016/j.renene.2017.05.085
Reference: RENE 8852
To appear in: *Renewable Energy*
Received Date: 30 December 2016
Revised Date: 19 May 2017
Accepted Date: 28 May 2017

Please cite this article as: José F. Gaspar, Mojtaba Kamarlouei, Ashank Sinha, Haitong Xu, Miguel Calvário, François-Xavier Faÿ, Eider Robles, C. Guedes Soares, Analysis of electrical drive speed control limitations of a power take-off system for wave energy converters, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.05.085

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Analysis of electrical drive speed control limitations of a power take-off**
2 **system for wave energy converters**

3
4 José F. Gaspar^a, Mojtaba Kamarlouei^a, Ashank Sinha^a, Haitong Xu^a, Miguel Calvário^a, François-
5 Xavier Fay^b, Eider Robles^b, C. Guedes Soares^{a,*}

6
7 ^a *Centre for Marine Technology and Ocean Engineering (CENTEC), Instituto Superior Técnico,*
8 *Universidade de Lisboa, Av. Rovisco Pais, 1049-001 Portugal.*

9 ^b *TECNALIA. Energy and Environment Division, Parque Tecnológico de Bizkaia, 48160 Derio, Spain.*

10
11 *Corresponding author E-mail address: c.guedes.soares@centec.tecnico.ulisboa.pt

12
13
14
15 **Abstract:** The active control of wave energy converters with oil-hydraulic power take-off systems
16 presents important demands on the electrical drives attached to their pumps, in particular on the required
17 drive accelerations and rotational speeds. This work analyzes these demands on the drives and designs
18 reliable control approaches for such drives by simulating a wave-to-wire model in a hardware in-the-
19 loop simulation test rig. The model is based on a point absorber wave energy converter, being the wave,
20 hydrodynamic and oil-hydraulic part simulated in a computer that sends and receives signals from the
21 real embedded components, such as the drive generator, controller and back-to-back converter. Three
22 different control strategies are developed and tested in this test rig and the results revealed that despite
23 the drive limitations to acceleration levels, well above 1×10^4 rpm/s, these do not significantly affect the
24 power take-off efficiency, because the required acceleration peaks rarely achieve these values.
25 Moreover this drive is much more economical than an oil-hydraulic and equivalent one that is able to
26 operate at those peaks of acceleration.

27
28
29 **Keywords:** Wave energy converter, Power take-off, Electrical drives, Hydraulic transformer, Wave-
30 to-Wire Model.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات