#### www.waterpowermagazine.com

Volume 69, No. 5, May 2017

#### **EDITORIAL**

Editor Carrieann Stocks Tel: +44 (0) 20 8269 7777 carrieannstocks@globaltrademedia.com Tweet: @waterpowermag

Contributing Editors Suzanne Pritchard, Patrick Revnolds

Editorial Assistant Tracey Honney

#### ADVERTISING SALES

Diane Tite - Sales Manager Tel: +44 (0) 20 8269 7854 Diane.tite@globaltrademedia.com

Glen Savage - Sales Manager, Power Group

#### PRODUCTION AND DESIGN

Production Controller Dave Stanford Classified Production Controller Sarah Lovesy Graphic Designer Karen Bishop



United Kingdom: Global Trade Media, Progressive House, 2 Maidstone Road, Foots Cray, Sidcup, Kent DA14 5HZ, UK.

Tel: +44 20 8269 7700. Fax: +44 20 8269 7804 Email: carrieannstocks@globaltrademedia.com

Italy: Ediconsult Internazionale, Piazza Fontane Marose 3, 16123 GENOVA, Italy Tel: +39 010 583 684, Fax: +39 010 566 578

Japan: Masayuki Harihara, Yukari Media Inc., 3-4 Uchihiranomachi, 3 Chome chuo-ku, Osaka 540-0037,

Japan: Tel: +81 6 4790 2222, Fax: +81 6 4793 0800. Email: ymi4886@cello.ocn.ne.jp

Subscription Office: For subscription enquiries, single copies or back issues: Progressive Intelligence Customer Subscriptions Department, 2 Maidstone Road, 2nd Floor, Sidcup, DA14 5HZ

Tel: +44 845 155 1845, Fax: +44 20 8269 7877 Email:cs@progressiveintelligence.com

#### North America only

International Water Power & Dam Construction (ISSN 0306-400X) is published monthly by Global Trade Media, Progressive House, 2 Maidstone Road, Foots Cray, Sidcup DA14 5HZ, UK. The US annual subscription price is US\$605.99. Airfreight and mailing in the USA by agent named Worldnet Shipping Inc., 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA.

Periodicals postage paid at Jamaica NY 11431. US Postmaster: Send address changes to International Water Power & Dam Construction, Worldnet Shipping Inc. 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA

Subscription Rates 1 YEAR SINGLE COPY UK£309.99 UK£32.99 US\$635.99 US\$67.99 USA/Canada airspeed Europe, inc EU, airspeed €481.99 €50.99 Rest of world airspeed Digital edition only: £216.99, €325.99, \$433.99

Published by Global Trade Media, a trading division of Progressive Trade Media Limited. Registered address: Progressive House, 2 Maidstone Road, Foots Cray, Sidcup, Kent DA14 5HZ, UK.

© 2016 Global Trade Media, a trading division of Progressive Trade Media Limited Printed by Stephens & George Print Group.

The paper used in this magazine is obtained from manufacturers who

operate within internationally recognised standards. The paper is made from Elementary Chlorine Free (ECF) pulp, which is sourced from sustainable, properly managed forestation.

MEMBER OF THE AUDIT BUREAU OF CIRCULATION





#### News

World News

## Spotlight

# 10 Growing steadily

Key trends in hydropower have been identified in the latest briefing from the International Hydropower Association.

### Small hydro

# 12 A global resource

A round up recent developments in the small hydropower industry.

# 15 Demonstration of small hydro

Highlighting Voith's recent activities in small hvdro.

# 16 SAM: a new concept for small hvdro

Details on SAM turbines, an alternative concept for low and medium head small hydropower plants from GE.

# 20 Small hydro to ease Samoan reliance on fossil fuels

The Fuluasou hydropower project is leading the way in renewables development in Samoa.

#### **BRICS**

#### 22 Big in BRICS

The 10 largest operating hydropower schemes across the BRICS countries.





# 26 Funding the gap

How can BRICS nations meet renewable energy investment targets?

# 28 China goes global

Detailing China's Going Global strategy.

# Seismic analysis

#### 32 Movement matters

A range of systems are available to monitor seismic safety of dams.

### 34 Seismic retrofit project

A seismic retrofit project has been initiated at Anderson Dam in the US.

## **Turbines**

#### 36 Welcome to the Batcave

A lithium-ion battery and hydropower are working together in the Nordics.

# 38 Kinetic hydropower: using the undiscovered energy of water

Hydrokinetic turbine development explored by Smart Hydro Power.

#### **Spillways**

# 40 Leading the way at Oroville

Developments at Oroville Dam.

# 42 The Oroville Incident – an opportunity for dam safety

Why the Oroville incident presents an opportunity to examine the state of dam practices