

# Qinfen (Katherine) Zhang

1 Bethel Valley Rd.  
P.O. BOX 2008, Oak Ridge  
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## WORK EXPERIENCE

2011.3 – Present **R&D Associate/Mechanical Engineer, Wind and Water Power Program, ESD, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA**

Technical support and research on Hydropower Advancement Project; Small Hydro Reference Model, and etc.

2009.10 – 2010.11 **Director of Technology, VP, Riverbank Power Corp., Toronto, ON., Canada**

1. Critical review on underground and above-ground closed-loop pump storage project design;
2. Life cycle assessment for pump storage hydro projects and associated electric power systems (funded by NSERC- Post-doc research subject);
3. Calculation of power generation and financial analysis for new sites of hydro development (both Run of River and Pump Storage projects);
4. Financial evaluation and acquisition of existing small hydro facilities;
5. Research on variable speed pump-turbine technology and help on turbine procurement; and etc.

2007.12 – 2010.03 **Hydraulic Engineer, Canadian Hydro Components Ltd., Almonte, ON.**

1. Selecting and sizing hydro turbines per specific site condition to provide turbine data sheet and quotation document;
2. Producing turbine performance curves (both efficiency and cavitations);
3. General arrangement of hydroelectric powerhouse (AutoCAD drawings);
4. Mechanical design of turbine parts (shaft, bearing etc.);
5. Blade vs. Wicket-gate Cam relationships for Kaplan turbines;
6. Preparing for generator specifications and load sheet;
7. Performing hydrological and hydraulic analyses;
8. Helping on bidding documents and purchase agreement; and etc.

2001.7 – 2011.3 **Waterhammer Specialist, associated with HydraTek & Associates Inc., ON.**

1. Developed a Numerical Model and Computer Program for Transient Analysis of Hydro Turbine Units, and Incorporated into *TransAM*;

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2. Transient Analysis and Control Measures for Bone Creek Hydro Project;
3. Preliminary Feasibility Study of a Pump-Storage Hydro Project in Ontario;
4. Transient Analysis for Energy Recovery Hydro Turbines – Several Sites – in Las Vegas Water Districts;
5. Water-hammer and Water Column Separation Analysis for Masjed e Soleiman Hydropower Plant in Iran;

2000.7 – 2001.1 **Invited Visiting Researcher, CEDEX, Madrid, Spain**

Numerical Modeling of Dam-Break & Debris Flow Using Finite Element Methods

1994.9 – 2000.6 **Assistant/Associate Professor, Dept. of Hydropower Engineering, Hohai University, Nanjing, China**

1990.5 – 1994.8 **Research Engineer, Hydraulic Research Center (Hydraulic Laboratory), Hohai University, Nanjing, China**

## AWARDS

2010: **Industrial R&D Fellowship** from NSERC, Canada

2004 – 2007: **Doctoral Scholarship** from NSERC, Canada

2002 – 2007: **Open Scholarship** from University of Toronto, Canada

2000 – 2001: **Fellowship** from CEDEX, Madrid, Spain for an International Cooperation Project

2000: **Second Prize of National Science and Technology Advancement**

Issued by Chinese Academy of Sciences for the project of

*“Water-hammer Theory Research and Engineering Applications”*

(No. 2000-J-222-2-06) (My name was in the third place among the group)

## EDUCATION

2009.7 **Ph.D.**, Department of Civil Engineering, University of Toronto, Canada

1998.12 **Dr. Eng.**, Hydropower Engineering, Hohai University, Nanjing, China

1990.5 **M. Eng.**, Hydraulics and River Dynamics, Hohai University, Nanjing, China.

1987.7 **B. Eng.**, Water Conservancy and Hydropower Engineering,

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Dept. of Hydropower Engineering, Hohai University, Nanjing, China.

## PUBLICATIONS

### **Peer-Reviewed Journal Papers:**

1. **Qinfen Zhang**, Bryan Karney, Lisheng Suo and Andrew Colombo (2011). "Stochastic Analysis of Waterhammer and Applications in Reliability-Based Structural Design for Hydro Turbine Penstocks". Accepted by J. of Hydraulic Engineering, ASCE.
2. **Qinfen Zhang**, Bryan Karney and Stanislav Pejovic (2011). "Non-reflective Boundary Design via Remote Sensing and PID Control Valve". Accepted by J. of Hydraulic Engineering, ASCE.
3. **Qinfen Zhang**, Bryan W. Karney and David L. McPherson. (2008) "Pressure Relief Valves Selection and Transient Pressure Control". August 2008, J. of AWWA. Vol.100, No.8, P62-69.
4. **Qinfen Zhang**, Bryan Karney, Heather L. MacLean, Jingchun Feng. (2007) "Life Cycle Inventory of Energy Use and GHG Emissions for Two Hydropower Projects in China". December 2007, J. of Infrastructure Systems, ASCE. Vol. 13, No. 4, p271-279.
5. M. Quecedo, M. Pastor, M.I. Herreros, J.A. Fernandez Merodo, **Qinfen Zhang**. (2005) "Comparison of two mathematical models for solving the dam break problem using the FEM method", J. of Computer Methods in Applied Mechanics and Engineering. 194, p3984-4005.
6. **ZHANG Qinfen**, SUO Lisheng. (2000) "Application of Stochastic Analysis of Water-hammer in Structural Design of Penstocks", J. of Hohai University, (ISSN 1000-1980) 28(2), 17-22. (In Chinese)
7. **ZHANG Qinfen**, SUO Lisheng, GUO Wenzhu. (2000) "A Further Study of Stochastic Analysis of Water-hammer Pressure in a Reservoir-pipe-valve System", J. of Hydroelectric Engineering, (ISSN 1003-1243) 2, 56-63. (In Chinese)
8. **ZHANG Qinfen**, SUO Lisheng. (1998) "Advances on Stochastic Analysis of Water-hammer and Surge", J. of Advances in Science & Technology of Water Resources, (ISSN 1006-7647) 18(3), 7-11. (In Chinese)
9. **ZHANG Qinfen**, SUO Lisheng, HU Ming. (1998) "Experimental Study on Layout of Approach Channels to Intake of River-type Reservoirs", J. of Hohai University, (ISSN 1000-1980) 26(3), 66-70. (In Chinese)
10. **ZHANG Qinfen**, SUO Lisheng. (1997) "Stochastic Model for Transient Analysis in Surge Tanks", J. of Hohai University, (ISSN 1000-1980) 25(3), 41-45. (In Chinese)
11. ZHU Dangsheng, **ZHANG Qinfen**, WANG Mulan. (1996) "Application of Information Entropy

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Theory to Study of Hydraulic Problems”, J. of Hydraulic Engineering, (ISSN 0559-9350) 9, Beijing, 33-37. (In Chinese)

12. WANG Mulan, **ZHANG Qinfen**. (1995) “Risk Analysis of Incipient of Cavitation in a Cascade of Orifice”, J. of China Shipbuilding, (CN31-1497/U), Oct.1995, 155-161. (In Chinese)

et al.

## **Peer-Reviewed Conference Papers:**

1. Bryan Karney, **Katherine Zhang**, Cory Williams, Richard Slopek (2009). “Transient Performance Evaluation and Control Measures for Bone Creek Hydropower Project”. Published and presented at Waterpower XVI Conference, Spokane Washington, USA, July 27-30, 2009.
2. **Qinfen Zhang**, Bryan Karney (2008). “Energy Recovery Hydro Turbines in water Supply system”. Published and orally presented at HydroVision 2008, Sacramento California, USA, July 14-18, 2008.
3. Deyou Liu, Feng Wang, **Qinfen Zhang**, Bryan Karney (2008). “Pump-Turbine Runner Lifting During Load Acceptance: An Exploration of Possible Causes”. Published and orally presented at Pressure Surges 10th International Conference, BHR Group, Edinburgh, Scotland, May14-16, 2008.
4. S. Pejovic, B. W. Karney, **Q. Zhang**, and G. Kumar (2007). “Small Hydro, Higher Risk”. IEEE Electrical Power Conference (EPC) 2007, Oct. 25-26, 2007 in Montreal, Canada.
5. Stanislav Pejovic, Bryan Karney, **Qinfen Zhang**. (2004) “Water Column Separation in Long Tailrace Tunnel”, Proceedings of HYDROTURBO 2004 international conference, Brno, Czech Republic, Oct. 2004.
6. Liu D. Y., **Zhang Q. F.**, Xu H.M. (2004) “Hydraulic experiment of arc-shaped gate on the Qinhuai River”, published and orally presented and in conference Proceedings of ISEH & IAHR-APD’04, Hong Kong, Dec. 15-18, 2004.

**Et al.**