PISCO, PERU, EARTHQUAKE OF AUGUST 15, 2007

LIFELINE PERFORMANCE

Edited by Alex K. Tang, P.E. and Jörgen Johansson

Technical Council on Lifeline Earthquake Engineering
Monograph No. 32
August 2008

ASCE

JSCE

Pisco, Peru, Earthquake of August 15, 2007

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SPONSORED BY
Technical Council on Lifeline Earthquake Engineering
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Published by The American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, Virginia 20191–4400

Library of Congress Cataloging-in-Publication Data

Pisco, Peru, earthquake of August 15, 2007 : lifeline performance / edited by Alex K. Tang and Jorgen Johansson ; sponsored by Technical Council on Lifeline Earthquake Engineering.
p. cm. -- (Monograph ; no. 32)
Includes bibliographical references and index.
ISBN 978-0-7844-1061-5
1. Lifeline earthquake engineering--Peru. 2. Earthquake damage--Peru--History. 3. Earthquakes--Peru. 4. Pisco (Peru)--History. I. Tang, Alex. II. Johansson, Jorgen, 1971- III. American Society of Civil Engineers.

TA654.6.P57 2008
624.1'762985--dc22 2010001589

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, Virginia, 20191-4400

www.pubs.asce.org

ISBN 978-0-7844-1061-5
Manufactured in the United States of America.

Preface

The Earthquake Investigation Committee of the Technical Council of Lifeline Earthquake Engineering (TCLEE), American Society of Civil Engineers (ASCE), was established to initiate, organize, train for, coordinate and evaluate the performance of lifelines following earthquakes. Members of the committee are employees of lifeline industries, consulting engineers, and universities from the United States and Canada. Committee members provide services on a voluntary basis. For some earthquake investigation, companies of participants do not require an individual to take vacation time for the investigation and may provide some support for expenses. ASCE also provides support to reimburse expenses. In addition to the time associated with the reconnaissance trip, the substantial effort by each individual to prepare a short report for the TCLEE Web page and the full report for the monograph series is all done on a voluntary basis. The cost of this effort is substantially more than the support provided by ASCE.

Individuals participating in the investigation need not be members of the committee or members of ASCE, but are expected to follow the Committee's earthquake investigation practices as described in the ASCE publication, TCLEE monograph 11, "Guide to Post-Earthquake Investigation of Lifelines." Members of the investigation team coordinate with other groups and may participate in groups organized by other organizations. They gather data relating to both good and poor performance, from domestic and foreign earthquakes, in order to provide information for practitioners to improve the performance of the lifeline systems. The foreign earthquakes that have been investigated include the 1985 Chile, 1988 Soviet Armenia, 1990 Philippines, 1991 Costa Rica, 1992 Kocaeli (Turkey), 1995 Kobe (Japan), 1999 Kocaeli (Turkey), 1999 Chi-Chi (Taiwan), 2001 Gujarat (India), 2001 Atico (Peru), 2004 Zemmouri (Algeria), and 2007 Kashiwazaki (Japan) earthquakes.

The Kobe earthquake report is the first foreign earthquake investigation report published by ASCE as a TCLEE monograph, number 14. The first domestic earthquake investigation report published by ASCE as TCLEE Monograph, Number 8, was for the Northridge earthquake. Prior to this time, TCLEE prepared a lifeline report that was published by the Earthquake Engineering Research Institute (EERI). The Earthquake Investigation Committee continues to cooperate with EERI to provide an abbreviated version of lifeline performance in Earthquake Spectra (EERI publication). TCLEE publishes brief preliminary reports on the ASCE/TCLEE Web page.

To provide information on the tectonic and ground motion data, experts in these fields are often asked to contribute to the reconnaissance report. This information is of value in providing a perspective to the lifeline damage report.

Alex K. Tang
October 2007

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TCLEE Monograph Series

These publications may be purchased from ASCE, telephone 1-800-548-ASCE (2723), World Wide Web http://www.asce.org.

The TCLEE web site is www.asce.org/community/disasterreduction/tclee_home.cfm

and click on publications.

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ASCE Manual

Schiff, Anshel J., Editor, Guide to Improved Earthquake Performance of Electric Power Systems, ASCE Manual 96.

TCLEE Earthquake Investigation Reports

TCLEE has also prepared numerous earthquake reports that have appeared in other publications. References to these reports and ten short reports associated with TCLEE monographs can be viewed on the ASCE/TCLEE web site address given below. The 10 short reports are each about five to 15 pages long, contain a summary of main observations and some pictures, and can be downloaded from *www.asce.org/community/disasterreduction/tclee_home.cfm.*

Acknowledgements

Most of the contributing authors of this report are members of the Earthquake Investigation Committee (EIC) of Technical Council on Lifeline Earthquake Engineering (TCLEE). Lucero Mesa, Carl Sepponen, Michael Salmon and Alex Tang were fully funded by ASCE, while Monique Nykamp and Mark Pickett were partially funded by ASCE. Tom Cooper was self-funded. Jorgen Johansson and Paola Mayorca were partially funded by Japan Society of Civil Engineers (JSCE) and the Japan Association of Earthquake Engineering (JAEE). ASCE support was received at the direction of Pat Natale (executive director), with support from John Durrant, John Segna, Michael Sanio, Stefan Jaeger, Tenzing Bashee, and Katerina Lachinova. Jack Lopez-Jara and Jack Lopez provided the team with local logistics support, including organizing meetings with engineering groups and universities, hotel arrangements and vehicle rental. Jack Lopez-Jara's extra effort was to accompany the team throughout the field investigation acting as our interpreter.

In addition to all the individuals acknowledged in the chapters, the investigation team was also assisted by many groups and individuals in the field. The debriefing session set up by Jack Lopez with presentations by Prof. Julio Kuroiwa of the National University of Peru proved to be valuable to the team prior to the field trip. He was also a senior advisor of the Peru Civil Defense. He was also involved in the recovery efforts after the earthquake. I would like to mention that Prof. Kuroiwa met us on a Saturday morning, demonstrating his full dedication and commitment to assist us to reduce earthquake losses and to save lives.

Ing. Gladys Villa Garcia, Prof. Daniel Quiun Wong and Prof. Manuel A. Olcese Franzero of the Catholic University of Peru, Department of Engineering, provided us with in-depth presentations of their findings and their research work of strengthening adobe buildings. The information that they gave us and allowed us to use made this report more complete.

We are also grateful that Bill Fullerton, John C. Kirch Jr., and Luisa Villanueva Brañez of Lima Airport Partners, who waited for us and provided us with detailed information of the events at the Jorge Chavez International Airport in Lima during the earthquake.

We are indebted to the field support and the information provided by Raul Torres, Juan Carlos Paz Cárdenas, and Carlos R. Vallez Velasquez-López of the Ministry of transportation and Communications (MTC), without which we would not have been able to accomplish so much in the time we had in the field. MTC, Ica Region, Ing. Juan Pedro Andia Morón provided one of his staff to accompany us on all our visits to the transportation sites.

We also met with Dr. Ing. Jorge E. Alva Hurtado of National University of Engineering and the President of Colegio de Ingenieros del Peru (CIP) and his colleagues, who shared their investigation information with us and allowed us to use their photographs in our report.

Alex Tang, F. ASCE, ASCE/TCLEE Investigation Team Leader

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Prof. Julio Kuroiwa prepared a lot of information and shared with the ASCE and JSCE teams. He also gave a few copies of his book titled Disaster Reduction Living in Harmony with Nature to us. (Photo courtesy of Jerome O'Connor.)

Prof. Daniel Quiun Wong of Catholic University, Peru, presented his findings and shared the information collected with the ASCE/TCLEE team members.