FIRE FOLLOWING EARTHQUAKE

Edited by
Charles Scawthorn, John M. Eidinger, and Anshel J. Schiff

Technical Council on Lifeline Earthquake Engineering
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Preface

Earthquakes are a continuing threat to mankind. The usual earthquake hazards of ground shaking, liquefaction, landslide, surface faulting and tsunami all combine to lead to destruction to life and property. Many building codes and other types of standards and guidelines already exist to deal with these hazards.

But much less well understood is the risk due to Fire Following Earthquake (FFE).

While building codes require seismic bracing of sprinklers and, in some cases, alternative water supplies, there are no guidelines, standards or codes that specifically address FFE. Since the 1980s there has been a growing interest in this issue amongst a relatively small number of researchers, practicing engineers and fire department officials. Recognizing the need to expand the knowledge base of the FFE hazard to a wider audience, TCLEE gathered a group of leading experts in the field to prepare this monograph. These experts have attempted to bring together in this monograph, a thoughtful and thorough examination of the many aspects of the FFE hazard.

While this monograph provides an excellent source of information about qualitative and quantitative methods to deal with the FFE hazard, this monograph should not be considered a Guideline, Standard or Code. There is still much to learn about the best ways to address the risk due to fire following earthquake. Perhaps at this point in time, it would be best for each community to develop a "defense-in-depth" approach to deal with this hazard. Not all communities need to adopt all the mitigation strategies. This Monograph should provide suitable source material for a rational approach to help build better disaster-resistant communities.

Charles Scawthorn, F. ASCE
John M. Eidinger, M. ASCE
Anshel J. Schiff, M. ASCE
Editors

Cover Picture

This aerial photograph of Balboa Boulevard in Los Angeles taken shortly after the 1994 Northridge earthquake illustrates the interaction of earthquakes, lifelines and fire. Due to a large landslide on nearly flat ground, water, sewer, and gas pipelines under Balboa Boulevard failed. The result was torrents of water from broken pipes flowing down the street. Gas escaping under pressure from the gas main was ignited by a passing pickup truck. The radiant heat from the resulting gas flare caused ignitions and fires that destroyed several homes adjacent to the street. Two aerial optical-fiber cables supported on poles were also destroyed. The optical-fiber cables contained major trunks connecting central offices, the failure of which disrupted telephone communications. Responding firefighters found no pressure in the hydrants, due to the broken water mains, and resorted to drafting water from backyard swimming pools.

TCLEE

The purpose of the Technical Council on Lifeline Earthquake Engineering (TCLEE) is to advance the state-of-the-art and practice of lifeline earthquake engineering. Members of TCLEE participate in the development of guidelines, pre-standards and standards for the seismic design and construction of lifelines. They encourage lifeline organizations, industries and associated manufacturers, associations and professionals to consider earthquakes and their impacts in the planning, design, emergency planning and operations of lifelines. They also serve as a primary resource for establishing broad consensus on lifeline issues; identify and prioritize research needs related to lifeline planning, design, construction and operation; and support and/or conduct programs for education and technology transfer on lifeline seismic issues.

TCLEE includes seven technical committees: Earthquake Investigations, Electrical Power and Communications; Gas and Liquid Fuels; Port; Seismic Risk; Transportation and Water and Wastewater. Membership to technical committees is open to practicing engineers, academics, manufacturers, public policy planners and other interested people. While many of TCLEE members are also members of ASCE, the wide variety of disciplines involved with lifelines allows that the committees are equally open to mechanical, electrical and other types of engineers, scientists, academics and planners.

Given the wide range of issues dealing with Fire Following Earthquake, the people who contributed to this Monograph include members from many of TCLEE's committees.

TCLEE Monograph Series

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