

Chapter 1

INTRODUCTION

1.1 PROJECT OBJECTIVES

On September 11, 2001, at 8:46:30 a.m. EDT, five hijackers flew American Airlines Flight 11 (AA 11), a Boeing 767-200ER aircraft, into the north face of World Trade Center (WTC) 1 at a speed of about 440 mph. At 9:02:59 a.m., five other hijackers flew United Airlines Flight 175, also a Boeing 767-200ER, into the south face of WTC 2 at about 540 mph. The aircraft impacts did considerable damage to the structure of the towers, but the towers remained standing. The impacts also triggered fires on multiple floors simultaneously. Such fires further weakened the structural systems of WTC 1 and WTC 2 and led to the collapse of both towers. WTC 2 collapsed first at 9:58:59 a.m. EDT, followed by the collapse of WTC 1 at 10:28:22 a.m. EDT.

The collapse of WTC 1 caused structural damage to WTC 7, a 47 story building to the north of the WTC complex. Damage to WTC 7 included severed exterior columns on the lower floors. The collapse of WTC 1 also resulted in initiation of fires on at least 10 floors of WTC 7, extensive window breakage on the south face of WTC 7, and loss of city water that supplied the automatic sprinkler system in the lower zone of WTC 7. After nearly seven hours of burning, WTC 7 collapsed at 5:20:52 p.m. EDT.

A principal part of the National Institute of Standards and Technology (NIST) investigation of the WTC disaster was the examination of the WTC 7 collapse. The specific objectives were to:

1. Determine why and how WTC 7 collapsed;
2. Determine all technical aspects of fire protection, occupant behavior, evacuation, and emergency response;
3. Determine what procedures and practices were used in the design, construction, operation, and maintenance of WTC 7; and
4. Identify, as specifically as possible, areas in current building and fire codes, standards, and practices that warrant revision.

This report describes the technical effort to meet these objectives. Much of the material developed to address Objective 3 and some of Objective 2 is found in the NIST NCSTAR WTC reports published in September 2005. Relevant content is summarized in this report, with references to the prior reports for those seeking more detail. NIST NCSTAR 1A is a summary report of the sequence of events at WTC 7 on September 11, 2001, the findings of the Investigation, and the NIST recommendations. Additional details on the collapse analysis appear in NIST NCSTAR 1-9A.