

**An Important note from the Principal Investigator Abolhassan ASTANEH-ASL on the document that follows:**

The following PowerPoint was presented by me (A. Astaneh-Asl) at the WTC Hearing held by the Committee on Science of U.S. House of Representatives on March 6, 2002. Three hours of Q/A by representatives. The Q/A part is also part of these WTC Archives.

Respectfully,

Abolhassan ASTANEH-ASL, Ph.D., P.E.

Professor and Principal Investigator for the NSF Funded UC Berkeley WTC Project (Duration: 10-2001 to 9-2002)

of 26

# Testimony of

**Dr. Abolhassan Astaneh-Asl , Professor**

**University of California, Berkeley**

**Before the Committee on Science of the U.S. House of  
Representatives**

**March 6, 2002 Hearing on**

**“Learning from 9/11: Understanding the Collapse of the  
World Trade Center”**

This document is part of the “World Trade Center Post-Disaster Reconnaissance and Perishable Structural Engineering Data Collection”, a research project funded by the U.S. National Science Foundation at the Univ. of California Berkeley with Prof. Abolhassan ASTANEH-ASL as Principal Investigator (<http://www.ce.berkeley.edu/~astaneh>) as the Principal Investigator. Duration of the project was from 10/2001 to 9/2002. Further Information and project archives are at <http://lib.berkeley.edu/ENGI/WTC>. © 2001 Abolhassan ASTANEH-ASL.

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**Chairman Boehlert, Members of the Committee, families of the victims of the 9/11 terrorist attack, it is a great honor for me to testify here today.**

**My involvement in the collapse of the World Trade Center is to conduct reconnaissance of the collapsed and damaged WTC buildings and to collect structural engineering perishable data.**

**The main objectives are to document failure modes, learn as much as possible from the collapse, collect material samples for further testing and conduct a realistic failure analysis of the towers subjected to impact and ensuing fire in order to understand the causes of the collapse.**

**Our project was funded by the NSF as one of the eight Quick Response Research Awards a few days after the WTC Collapse. The other seven NSF grants are in the areas of fire engineering, social sciences and response and recovery.**

**I started my studies almost a week after the collapse and since then I have been able to investigate the structural elements of the WTC and have collected data on failure modes, fire and impact damage and have identified and saved sections of the structure that appear to be impacted by the plane or have collapsed under an intense fire. I have also investigated quality of construction.**

# Here are some examples of our findings.

<http://lib.berkeley.edu/ENGI/WTC>



Photo by William Farrington for A. Astaneh's WTC NSF Project.  
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<http://lib.berkeley.edu/ENGI/WTC>



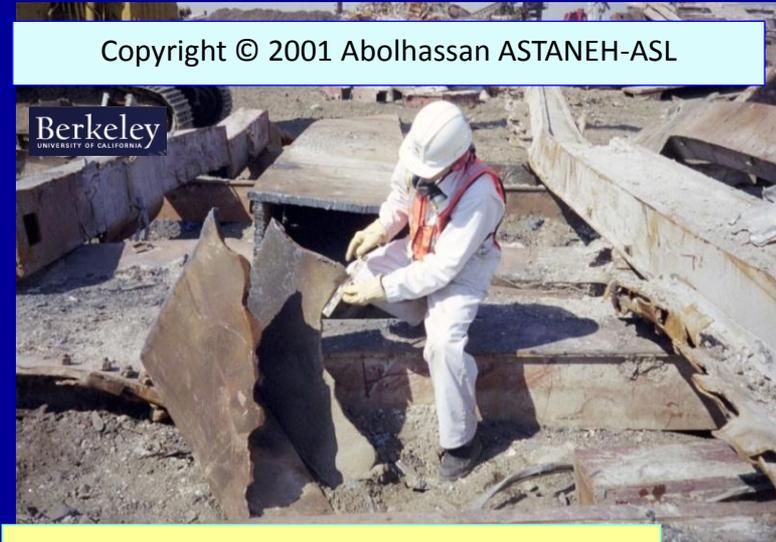
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Photo: HNSE

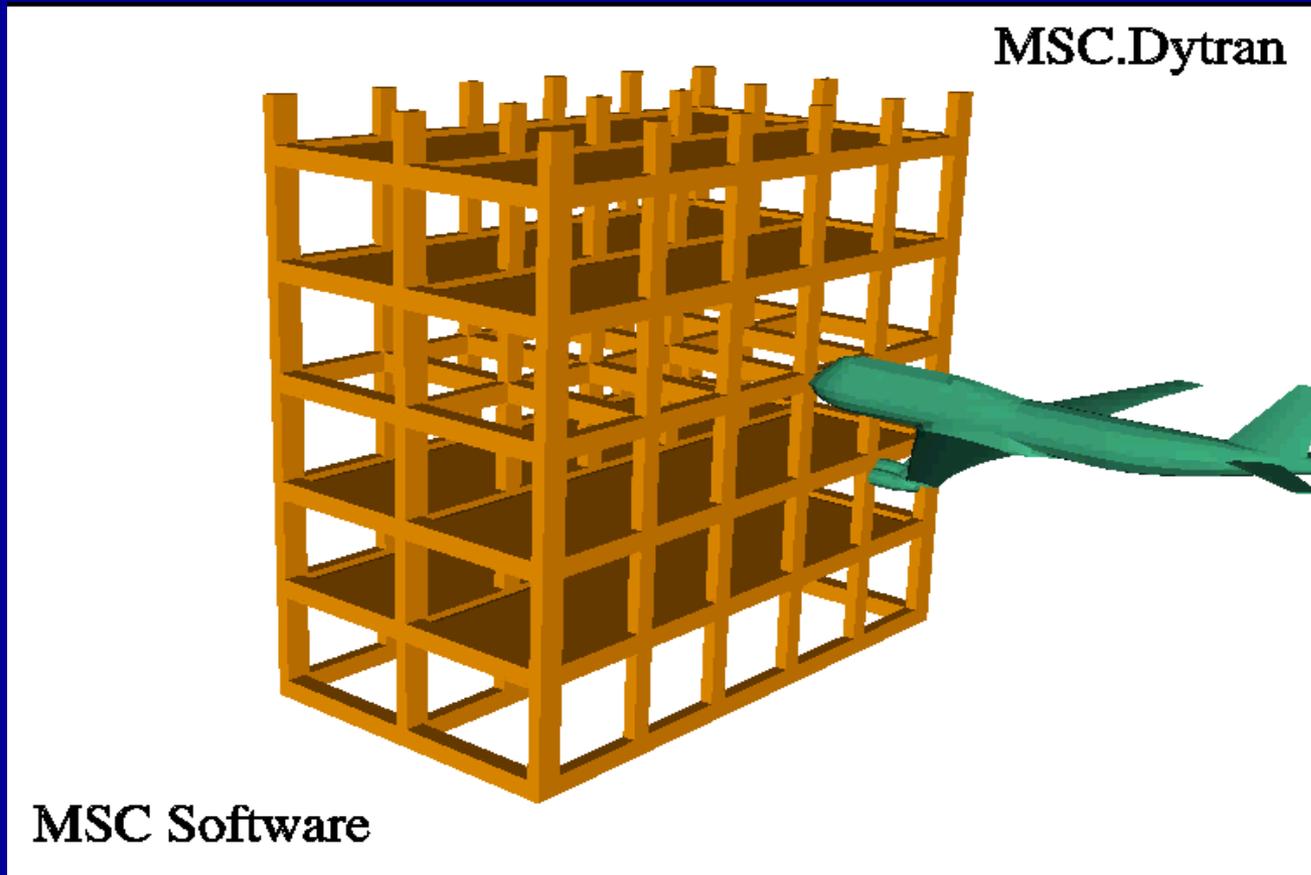
**We were and still are planning to build a realistic computer based structural model of the WTC towers, subject the model to realistically simulated impact of the planes and ensuing fire and conduct a detailed stress analysis.**

**However, since we have not been able to obtain drawings and other data, we are unable to proceed with our studies.**

**I would like to show you the results of such analysis of a generic building and what type of stress analysis we can do on WTC to understand its collapse.**

# Fully loaded plane entering the structure and damaging it..

*University of California Berkeley and MSC Software Corporation*

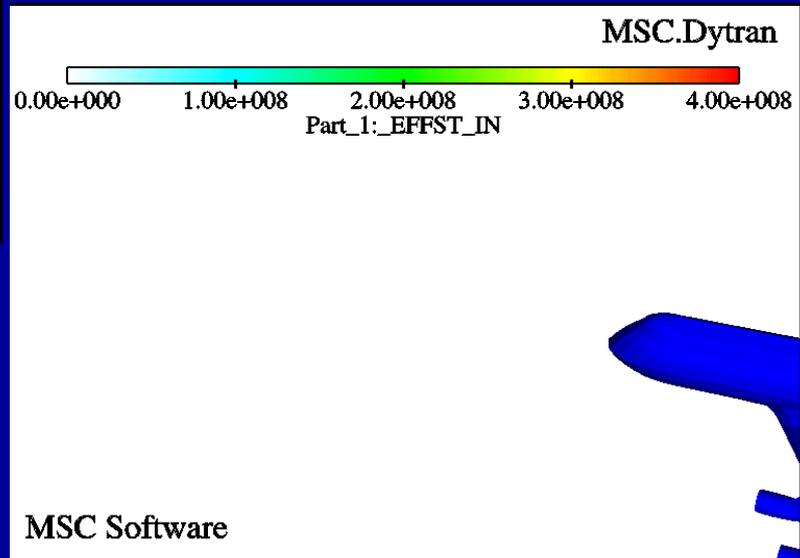


Studies of World Trade Center, Principal Investigator: A. Astaneh-Asl , University of California, Berkeley  
Sponsor: Civil and Mechanical Systems Program, National Science Foundation

# Studies of the World Trade Center

## University of California, Berkeley

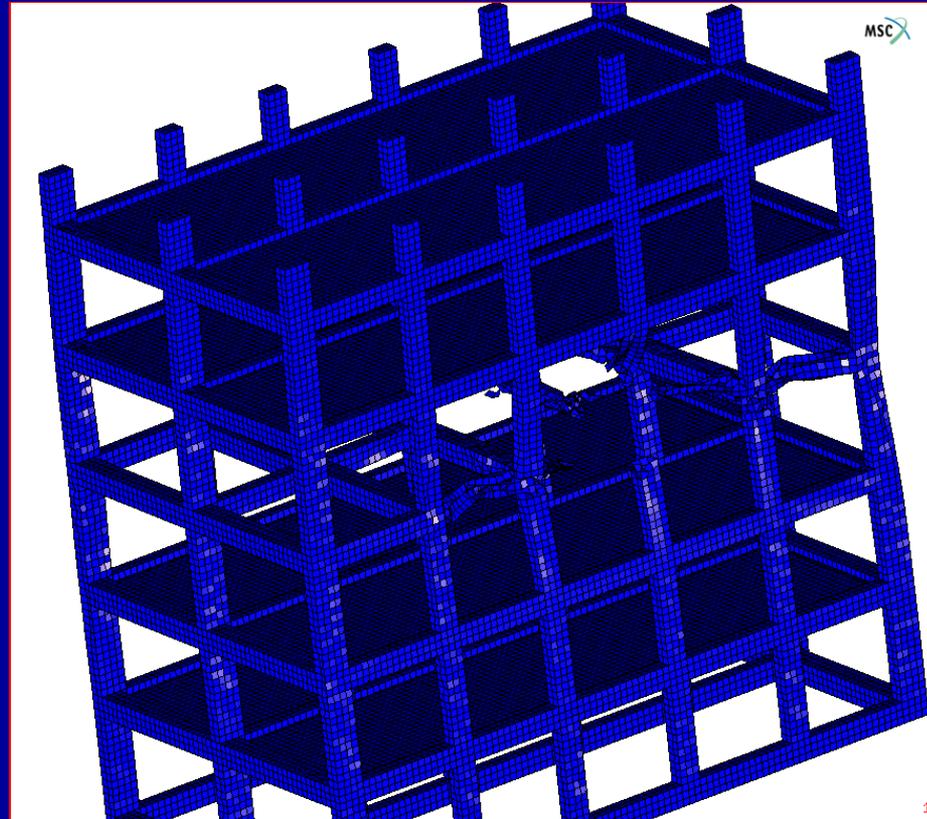
### and MSC Software Corporation



Principal Investigator: A. Astaneh-Asl , Sponsor: National Science Foundation

# Studies of the World Trade Center University of California, Berkeley and MSC Software Corporation

*Fire Heating-up Damaged Structure, Weakening it and the Structure Collapses under the Gravity Load.*



Principal Investigator: A. Astaneh-Asl , Sponsor: National Science Foundation

## **The impediments to our studies were:**

- ❑ Not having access to Ground Zero and surrounding damaged buildings**
- ❑ Not having enough time to inspect the WTC steel before it was recycled**
- ❑ Not having the drawings, videotapes, photographs and other data on the building to conduct our analysis of the collapse.**

**On the subject of research needs, there are pressing needs for short term as well as long term research related to the WTC collapse. In short term, there is an urgent need for a comprehensive, in-depth and scientific study of the collapse of the WTC Towers.**

**Due to unprecedented nature of collapse and its complexity, a broad based team of experts from academia, government agencies and private sector needs to be assembled to conduct such research-oriented investigations within a federal entity such as NSF and/or NIST.**

**In the long term, there is a need for major and sustained funding to conduct basic and applied research on various aspects of terrorist attacks. Such research programs can be directed by the National Science Foundation which over the last few decades has directed so successfully the research and technology development in the area of earthquake hazard mitigation among many others.**

**As for the fire research NIST traditionally has been the leading research and development agency. Also significant amount of research has been done in academia.**

**Such research activities, supported by the Congress, can result in development of scientific methods and technologies that can be used to assure life safety in the event of future terrorist attacks and minimize the impact of such attacks on the national security, economy and quality of our lives.**

**I would like to take this opportunity and thank Chairman Boehlert and members of the Committee on Science for inviting me to testify.**

**I would like now to welcome any questions that you may have.**