

Ethics and the Official Reports about the Destruction of the World Trade Center Twin Towers (WTC1 and WTC2) on 9/11: A Case Study

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Abstract—The final official reports on the destruction of the World Trade Center Twin Towers (WTC1/2) were published in September, 2005 by the National Institute of Standards and Technology (NIST) [1]. Since then, serious questions have been raised by over 2100 qualified architects, engineers and scientists about how NIST selected the forensic evidence to be included and about the processes used to reach its conclusions [2]. This is troubling for such important reports. The public has come to expect that analyses would depend on peer review to verify the soundness of a scientific work and ensure that the conclusions are the result of a consistent, transparent and ethical process. This is especially important in reporting on an event with such major consequences as that of September 11, 2001.

Keywords—*demolition; explosive; gravity; dust; powder; nano-thermite; iron; micro-sphere; health; negligence; ethics; peer-review; 9/11; World Trade Center Twin Towers*

I. OVERVIEW

On September 11, 2001, the Twin Towers at the World Trade Center (WTC) in New York City suffered damage from aircraft impact followed by fires. In less than two hours from the first plane impact, both steel-framed structures were destroyed all the way down into their basements. These destructions were accompanied by audible explosions as reported by scores of witnesses [3]. Thousands of citizens trapped in the Towers, and many nearby, were killed. Most of the buildings' material was ejected outside the footprints of the buildings (see Fig. 1). The concrete and building contents were largely pulverized to a very fine powder which was deposited over lower Manhattan by a pyroclastic-like "dust" cloud. Steel columns were broken into short lengths.

At 5:20 pm that same day, World Trade Center Building 7 (WTC7) a modern, highly secure, 47-story skyscraper that was not hit by an airplane was destroyed with unnatural symmetry and later determined to be at free-fall acceleration for over 30.5m (100 feet), in the exact manner of professional controlled demolitions that use explosives. The National Institute of Standards and Technology (NIST) initially denied the free fall of WTC7 as not being physically possible, but after being forced, through a public session, to admit that free fall had actually occurred, NIST never explained it [4] [5]. Before or since 9/11, no high-rise steel-framed building has

ever been significantly dismantled let alone completely destroyed except by controlled demolitions planned in advance.



Fig. 1. Impaled Columns in Aftermath

The Federal Emergency Management Agency (FEMA) and the American Society of Civil Engineers (ASCE) began the investigation into the three building collapses and found "very unusual" severe high temperature corrosion and erosion with sulfidation in steel samples from WTC1/2 and WTC7 [6]. FEMA stated that "No clear explanation for the source of the sulfur has been identified." But in its final report, NIST, mandated to "establish the likely technical cause or causes of the building failure," never mentioned this unresolved question of evidence that suggests high temperature incendiaries [7].

NIST stated that since the "remains of the towers" were disposed of before its investigation began on October 1, 2002, its reports have "uncertainties" [8]. However, NIST received 236 steel samples from the WTC (0.50% by weight of the Towers' steel), starting six months before that date [9]. At this time, April 2002, there was a bill in process in Congress to give NIST full charge of the investigation [10]. WTC debris clean-up finished on May 30, 2002. Thus NIST, like FEMA, had a legitimate reason and opportunity to protest the rapidity and manner of ongoing steel and debris removal by New York City at ground zero [11]. This removal hampered evidence collection and selection of samples but there was no visible protest from either FEMA or NIST. Despite a public outcry championed by fire science professor Glenn Corbett (John Jay College of Criminal Justice), most of the steel was shipped away to be melted down [12]. Nevertheless NIST did have some suitable samples to initiate a proper investigation [13].

In its work plan, NIST cited the "scarcity of physical evidence," promised the "accumulation of copious photographic and video material," and stated its intention to simulate the Towers' behavior with computer modeling [14]. But NIST never attempted to explain the physical evidence of the building destructions such as what caused four ton perimeter columns and other debris to be ejected horizontally in all directions from the "collapsing" Towers at speeds of up to 70 mph, or why column sections weighing many tons were stuck in buildings hundreds of meters (feet) from the Towers as in Fig.1 [15] [16]. From the outset, NIST failed to follow scientific protocols to accumulate, examine and explain the available evidence. This failure and other failures cited in this paper are clearly in violation of the scientific method and constitute an egregious ethical failure.

II. ETHICAL VIOLATIONS BY NIST – A CASE STUDY

In any scientific investigation, use of selective or fraudulent data to support a hypothesis or claim is an ethical violation whose severity can depend on the circumstances. For events that involve great loss of life and property, and that may represent a criminal act, or a systemic problem that may occur again unless dealt with honestly and correctly, omission and misrepresentation become synonymous with "criminal negligence." West's Encyclopedia of American Law defines criminal negligence in this way [17]:

Criminal Negligence: "The failure to use reasonable care to avoid consequences that threaten or harm the safety of the public and that are the foreseeable outcome of acting in a particular manner."

All professional organizations have codes of ethics. For example, the National Society of Professional Engineers (NSPE) requires its members "to exhibit the highest standards of honesty and integrity." The Association of Certified Fraud Examiners (ACFE) requires an examiner to "reveal all material matters ... which, if omitted, could cause a distortion of the facts." The Institute of Electrical and Electronics Engineers (IEEE) has a code of ethics regarding safety, health, the environment, honesty and realism in stating claims, and the seeking of honest reviews [18]. Major events especially require adherence to ethical standards that uphold the credibility of these and similar professional organizations.

In a world with many thousands of steel-framed buildings, the complete destruction of three such buildings on the same day with great loss of life is an occasion to demand a strictly open and honest investigation, use of accepted codes of procedure, and adherence to sound scientific and engineering principles in order to determine whether other buildings are at risk. If, in addition, an incomplete or dishonest investigation will encourage actions or inactions that place thousands of human beings at home and abroad at risk, such a flawed investigation can be considered an ethical violation and criminal negligence of the most serious kind.

The following sections describe ethical failures by NIST in its study of the Twin Towers that go far beyond any reasonable excuse for their occurrence, and that, under the circumstances, constitute a high level of ethical failure.

A. Failure to Study the Destructions and their Aftermaths

Buildings can collapse naturally under gravity for several different reasons that include fire, earthquake, subsidence, and poor construction. The appearance of the building during and after collapse can point strongly to the reason for the collapse. Therefore the study of a building's actual collapse and its aftermath can provide the most direct evidence leading to the reason for collapse. Figs. 2 and 3 show the destruction of the North Tower (WTC1). The most salient observation is that the destruction is showing lateral ejection of materials in all directions. This behavior is not indicative of a mid-structure weakening followed by gradual deformation and an ensuing structural failure. Rather, it is consistent with explosive ejection and pulverization.



Fig. 2. North Tower Destruction –Side View

For the Twin Towers (WTC1/2), NIST examined only the period BEFORE the actual destructions began but nevertheless concluded that there was "no corroborating evidence ... for controlled demolition using explosives" [19]. This approach ignored the fact that most evidence of controlled demolition appears only after a demolition begins.



Fig. 3. North Tower Destruction –Aerial View (WTC7 is in the middle, right of center)

Never before or since 9/11 have high-rise steel-framed buildings collapsed from fire, nor has any building been known to crush and pulverize itself at near free-fall acceleration when a smaller top portion can no longer be supported. Videos of the first few seconds show that the top section appeared to descend, improbably, through the path of greatest structural resistance and disintegrate as it fell. A “collapse” in the manner exhibited in Figs. 2 and 3 can occur only through a controlled demolition. NIST never gave a theory that explains the tower “collapses” and the attendant observations, but nevertheless concluded that the Towers’ destructions on 9/11 were entirely gravity-driven [20].

NIST had in its possession copious photographic and video material showing the Towers’ destructions [14]. By failing to study the actual “collapses” and their aftermaths, NIST avoided not only the most direct evidence, but also the whole question of the use of explosives. These omissions violate professional ethical standards as well as the scientific method.

B. Failure to Follow NFPA Guidelines

NIST never examined the WTC powder, usually but inaccurately called “dust,” and did not look for evidence of explosives. Guidelines developed by the National Fire Protection Association (NFPA) in collaboration with NIST are strongly recommended for any investigation. The NFPA 921 Standard in cases of catastrophic building collapse reads [21]:

“18.3.2 High-Order Damage. High-order damage is characterized by shattering of the structure, producing small, pulverized debris. Walls, roofs, and structural members are splintered or shattered, with the building completely demolished. Debris is thrown great distances, possibly hundreds of feet. High-order damage is the result of rapid rates of pressure rise.”

The NFPA standard for high-order damage describes almost exactly what happened to the Twin Towers as shown in Figures 1, 2 and 3. All furnishings, walls, the concrete floors and steel floor pans holding them, were pulverized or fragmented. Massive steel columns weighing many tons were hurled hundreds of meters (feet) in all directions. Human bodies were completely fragmented; bone fragments were found on the top of the 565 foot high Deutsche Bank which is across Liberty Street from the Twin Towers. Furthermore, over one thousand victims had no remains that could be identified at all [15] [22].

Independent scientists and others, such as the RJ Lee Group and the United States Geological Survey (USGS) who examined the WTC powder, found a very high percentage of iron-rich micro-spheres whose formation requires temperatures higher than the melting point of iron or steel and therefore much higher than temperatures associated with the burning of jet fuel and office materials [23] [24]. Independent scientists subsequently found red-gray chips containing unreacted nano-thermite in the powder [25]. Nano-thermite

may be formulated to have explosive as well as incendiary properties. Its reaction product is mainly molten iron that may be dispersed by explosive force as tiny droplets with a shape approximately spherical – being controlled by surface tension. These droplets cool and solidify as iron-rich micro-spheres. Tests of the red-gray chips showed that on a gram-per-gram basis, they had an energetic capability similar to Trinitrotoluene (TNT) [25] [26].

Given the amount of death and destruction, and the consequences that followed, NIST’s failure to follow the principles contained in the NFPA standard for high-order damage is inexcusable and unethical in the extreme.

C. Failure to Consider Consequences to Public Health

By failing to examine the WTC powder and the abundant evidence for the use of explosives, NIST has severely downplayed the toxic effects on, and greatly inhibited public response to, those who breathed the powder without protection. The powder contains very fine particles of concrete, iron, asbestos, glass, computer innards (with toxic metals such as lead, mercury, cadmium), and building materials, creating a highly-toxic mixture hazardous to health [27]. In a purely gravity-driven building collapse, such a lethal mixture of fine particulates would not have been created or dispersed so widely.

NIST’s failure to test the WTC powder and its avoidance of all evidence of the use of explosives has delayed recognition of the lethal nature of the powder. A significant potential for loss of life continues to this day, raising ethical questions of a dire nature. Under Public Law 107-231 Congress empowered NIST to investigate “any building failure that has resulted in substantial loss of life or that posed significant potential of substantial loss of life” [7]. A large population of rescue workers and first responders were exposed to harmful airborne substances without warnings by the US Environmental Protection Agency (EPA) or FEMA. The EPA one week after 9/11 misleadingly declared the air “safe to breathe” [28]. Research that, through ethical lapses, subjects and/or prolongs human beings’ exposure to, or suffering from, harmful substances or diseases violates the Nuremberg Code of 1947 and the Belmont Report of 1979. In 2010, President Obama apologized to the President of Guatemala for the United States’ role in exposing human beings to diseases in experiments in Guatemala from 1946 to 1948 [29].

More recently, in September 2013, Tufts University banned research on human beings by a researcher for two years, and placed the researcher under supervision after that, for feeding genetically-modified rice to children in a study without disclosing the rice’s nature to the parents. In China, several researchers involved in the study lost their jobs [30].

In the case of those who breathed the WTC powder, hundreds have died, and tens of thousands are sick or at risk [31] [32]. It is especially egregious that many of these were firefighters, police and first responders who worked in dangerous

circumstances to do search and rescue. Recent research indicates the presence in the lungs of these workers of carbon nano-tubes whose toxicity has been compared with that of asbestos fibers. [33] These inhaled particles can only reasonably be attributed to the prior reaction of energetic materials, such as the nano-thermite mentioned previously [25] [34].

In short, one can only view NIST's ethical failure to study all the evidence, as required by the scientific method, as a failure with momentous and on-going health consequences for many thousands of human beings.

D. Failure to Show Collapse Visualizations

At a conference at its Gaithersburg headquarters held shortly after publishing the Twin Towers' reports, NIST "showed detailed computer generated" visualizations "of both the plane impacts and the development of fires within WTC1 and WTC2." But the "actual collapse mechanisms of the towers were not shown" as visualizations [35] [36]. Such visualizations could be used to validate or disprove NIST's structural finite element analysis model. NIST's model cannot be accepted unless it demonstrates that a gravity-only mechanism could eject the majority of the building structure into a 1200 foot diameter debris field centered around each tower, and it must explain the "downward movement of building mass" consistent with the laws of the conservation of momentum and energy [37] [38]. In particular, NIST's theory must explain the smooth acceleration of the top block and the absence of any abrupt deceleration or "jolt" necessary to create an amplified load that could result in the collapse of the lower portion of the building. [39] [40]

The Twin Towers were over-designed to support 3 to 5 times their actual loads [41]. The integrity of the Towers after the impact validates the designer's statement that they were built to sustain the effects of impact by large, commercial aircraft. It is therefore critical to determine why such buildings failed despite the architectural and engineering pre-planning that went into their construction. Despite protests from highly-qualified structural and fire science engineers, NIST dismissed the value of collapse visualizations [36]. Architects and engineers must have this information in order to design tall buildings that will provide safety to the public.

Once again NIST displayed its lack of scientific ethics by omitting an important component of the analysis and then asserting that its conclusion of a gravity-driven collapse was supported by its incomplete analysis.

E. Misrepresentations by NIST

NIST and other researchers agree that the jet fuel was fully consumed in the first few minutes after impact and "did not significantly affect the overall heat released" [42]. Once the fuel was consumed, there were only office furnishings to maintain the fires. Core columns did not experience temperatures greater than 250° C, as shown by samples collected from fire-damaged regions, and there was no

evidence that any steel samples reached temperatures above 600° C for more than 15 minutes [43].

The verticality of the collapses of the Towers through the path of greatest resistance indicates simultaneous destruction of all of the core columns and perimeter columns. This is not consistent with the locations of the heat. The outer perimeter columns were subject to cooling and there was no significant flammable material around the core columns because they were surrounded by elevator shafts. Nevertheless, NIST claimed temperatures of the short-lived fires were high enough to cause instantaneous building collapse initiations at 56 minutes (WTC2) and 101 minutes (WTC1) after plane impact.

NIST allowed that "the towers withstood the impacts and would have remained standing were it not for the dislodged insulation (fireproofing) and the subsequent multi-floor fires" [44]. NIST theorized that floor trusses with compromised insulation were then heated until the floor system failed and initiated collapse.

NIST performed a few tests using a modified 12-gauge shotgun at short range, and then claimed this supported the widespread dislodgment of insulation. This is a scientifically unwarranted extrapolation in a very complex and unknown situation [45].

NIST's theory is contrary to its own tests on WTC1/2 replica floor assemblies, carried out by Underwriters Laboratories (UL). These tests consistently showed sagging of only 15.2 to 20.3 cm (6 to 8 inches) after 2 hours in the furnace, measured at the center of the lower chords. This sag would produce negligible shortening of floor trusses, yet NIST claimed that the sag had pulled the perimeter columns inward far enough to initiate their buckling collapse. In its computer model, NIST used a sag of 106.7 cm (42 inches). This is clearly falsification of test results [46].

No other high-rise steel-framed buildings have ever collapsed though some have been completely engulfed in fire for many hours [47] [48]. NIST's unwarranted assumptions and misrepresentations for the Twin Towers violate professional ethical standards as well as sound scientific principles.

F. Failure to Provide the Most Essential Theory

NIST's study "does not actually include the structural behavior of the tower after the conditions for collapse initiation were reached and collapse became inevitable" [49]. NIST claims that a floor sagging downward pulled in exterior columns initiating the collapse. NIST provides no theory whereby a sagging floor or buckling columns on one side could lead to the observed completely vertical descent. There is no explanation for the crushing and pulverization of the undamaged, stronger, much larger portion of the building underneath at about two-thirds of free-fall acceleration, no explanation of how the upper portion disintegrated in midair and no explanation for the horizontal ejection of a large fraction of the building structure.

Despite eyewitness testimony to explosions (over 100 such witnesses) and many public testimonies to the presence of molten steel in WTC rubble (fire fighters, workers, and so on), NIST categorically and publicly denied this eyewitness evidence of demolition and high temperature metal [3] [50]. It is impossible for an observer to distinguish between molten steel and molten iron. Claims of either are consistent with the thermite reaction which, if confined, will produce iron at temperatures above 2500° C, while steel melts below the melting point of iron (1540° C), the exact value depending on the alloy used.

FEMA documented a 1200 foot diameter debris field around each tower [37]. The evidence for a gravity-only collapse is non-existent because the building mass remaining within the footprint of the building at the conclusion of the destruction was insufficient to have destroyed and violently pushed aside the undamaged lower 80 floors. Fourteen survivors, including members of the New York Fire Department, were in the fourth floor stairwell of WTC1 - the so called "Miracle of Ladder 6." Once the dust cleared, they reported looking up into the open sky instead of being buried under 100 stories of rubble [51].

Thus NIST's 10,000 pages of NCSTAR reports clearly lack the most essential theory needed to substantiate a gravity-driven collapse. Such a theory would describe how the collapse began and progressed at a rate of acceleration of the top portions equal to about two-thirds of gravitational free-fall, why the concrete floors and steel pans and most everything else were fragmented or pulverized to a fine powder, why exterior aluminum cladding and massive steel columns were severed and propelled hundreds of meters (feet) from the buildings, and why the powder contained an excessive concentration (in one study, almost 150 times normal expectations) of iron micro-spheres as well as unreacted nano-thermite [52]. The theory would also have to explain the energy source needed to sustain fires in the debris pile that could not be extinguished for many weeks. By claiming a gravity-collapse mechanism as its conclusion, NIST has perpetrated a scientific fraud of major proportions.

G. Failure to Seek Independent Review

NIST permitted only limited public comments and its final report did not include an independent peer review process. Requests for supporting materials and key analysis have been refused by NIST.

Scientist Dr. William B. Willers corresponded about NIST peer reviews with Thomas DiBlasi, President of the National Council of Structural Engineers Associations, Dr. Gene Corley who led the FEMA WTC Building Performance Study, and Dr. James G. Quintiere, fire protection expert, with little success. Quintiere stated: "I know of no peer review of the NIST work on WTC. They had a[n] Advisory Committee, and even some of them did not agree with the NIST work and conclusions." In a paper on the WTC investigation, Quintiere ends with this statement: "I would recommend that all records of the investigation be archived, that the NIST study be

subject to a peer review, and that consideration be given to reopening this investigation to assure no lost fire safety issues." This statement speaks for itself as regards NIST's ethical failure to obtain peer reviews [53] [54].

III. CONCLUSION

The US Department of Health and Human Services, Office of Research Integrity, defines "Research Misconduct" as including fabrication or falsification [55]. Its definition of fabrication includes making up data or results, while the definition of falsification includes omitting data. Some of the inputs to NIST's WTC1/2 computer model appear to be fabricated, and there is no way to judge the model without independent scrutiny. NIST's failure to follow the NFPA code and test for explosives and omission of key evidence for controlled demolition is falsification since it concerns highly relevant data that was excluded. NIST's report underwent no independent peer review before publication.

NIST's model did not proceed past the point where initiation of collapse was asserted to be imminent and therefore did not cover the actual collapse. The collapse was clearly the crucial portion of the investigation. This omission was in defiance of the stated objective to determine "why and how WTC1 and WTC2 collapsed".

NIST's report for WTC1/2 is highly suspect from an ethical standpoint, with alarming consequences for society. To maintain the integrity of the engineering profession and indeed respect for science itself, engineers and scientists everywhere must speak out and demand a new, open and transparent, peer-reviewed study into the skyscraper destructions at the World Trade Center using all the available evidence.

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