

Falsifiability and the NIST WTC Report: A Study in Theoretical Adequacy

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“Each individual possesses a conscience which to a greater or lesser degree serves to restrain the unimpeded flow of impulses destructive to others. But when he merges his person into an organizational structure, a new creature replaces autonomous man, unhindered by the limitations of individual morality, freed of humane inhibition, mindful only of the sanctions of authority.” Milgram, S.[1]

A Word on Interpretation

It has been said that the world is one continuous Rorschach inkblot test: we see what we expect to see based on our fears and desires. All sides of the World Trade Centre (WTC) collapse issue can see definitive corroboration in the same photos and videos, the same laboratory tests and the same reports. In this way both authors of this paper initially accepted the official explanation for the collapse of the buildings, as set out in the technical report of the National Institute of Standards and Technology (NIST),[2] but they now undeniably approach the report from a skeptical perspective.

The NIST Report is not a special case in which logic and rationality do not or should not apply. Given proper resources for investigation, there can be nothing mythical or unexplainable about the collapse of the towers. If the accumulated explanation falls short of making sense, it should give anyone—regardless of ideological leanings—a reason to be suspicious and a cause to look more deeply into what happened that day. The official explanation should be a testable theory outlining a sequence of events. It should be able to explain the physical evidence and should not dismiss incongruous empirical data as irrelevant. On this, we can all agree.

Theoretical Adequacy

It is our contention that the conclusions proffered by the NIST report, if analyzed against data from within the report itself, demonstrate critical inconsistencies. The most obvious of these relates to the temperature at which the structural steel is likely to fail. The NIST report does not take into account the results of their own laboratory-controlled floor truss tests in which the steel reached temperatures in excess of 800° C without failure, as we shall see. The fact that the test trusses survived temperatures far beyond the temperature possible in the towers, while heavily loaded, for far longer than either tower stood, should be indication enough that the NIST theory of collapse may be incomplete at best. However, the report authors seem unwilling to account

[1] Milgram, S., “Obedience to Authority: An Experimental View”, 184, Harper Collins, (1974).

[2] Sunder, S.S. et al. NISTNCSTAR1: Final Report of the National Safety Team on the Collapse of the World Trade Center Towers, <http://wtc.nist.gov>

for these disparities despite repeated written requests for redress of this and other pivotal issues.[3]

Probabilities

We make judgments every day regarding the probability of certain events: i.e., that our vehicle will not catch fire; that our chair will sustain our weight, etc. These are reasonable probabilities on which most of us waste little deliberative thought. The fact remains that these judgments are probabilities, not guarantees. The same applies to any investigation, scientific, criminal or otherwise; it must appeal to relative probabilities for an answer, not certainties.

For brevity, this analysis examines just two essential principles for determining the probability of a theory:

1. Experimental repeatability: The events espoused by a theory should be repeatable, or at least should exhibit directly corroborative phenomena, in analogous circumstances. Theories that depend on results that are never repeatable are worthless as explanations.

We should be able to agree that theories that fly in the face of long-standing, fundamental principles which have exhibited exceptional repeatability (for example the laws of physics and thermodynamics) are highly questionable and require very strong evidence to even consider as possible, much less as likely, explanations.

2. Falsifiability: Every theory worth examining should have some explicit criterion for rejection. If we suspect a theory of being non-falsifiable, we may search for a test that would satisfactorily refute it. If none can be discovered, there is no way to find that the theory is false, hence no reason to award it a provisionally acceptable status.

It bears repeating that adherence to the above principles does not necessarily give us “truth”. What it provides is a procedure which enables us to evaluate and compare explanations in a world where absolute truth is not possible.

Falsification

Theories come in three varieties: false, possible and worthless. The hallmark of a good theory is its ability to predict the outcome of a controlled experiment. If it fails to predict the outcome, it is false but may simply require revision. If it *cannot* predict the outcome of a controlled experiment, even if revised, then we can rest assured that it is not a fruitful theory at all.

For a more precise formulation, we turn to the originator of this concept,[4] Karl Popper:

[3] Gourley J.R., B. McIlvaine, S.E. Jones, K. Ryan, and R.Gage, Request for correction, <http://journalof911studies.com/volume/200704/RFCtoNISTbyMcIlvaineDoyleJonesRyanGageSTJ.pdf>

Appeal, <http://journalof911studies.com/volume/2007/AppealLetterToNISTGourleyEtAl.pdf>

[4] As Imre Lakatos and others have pointed out, even Popper’s conception is incomplete as a demarcation method. However, because of the specificity of the NIST case concerning the Twin Towers—in that it is not so much a

“Einstein’s gravitational theory had led to the result that light must be attracted by heavy bodies (such as the sun), precisely as material bodies were attracted. As a consequence it could be calculated that light from a distant fixed star whose apparent position was close to the sun would reach the earth from such a direction that the star would seem to be slightly shifted away from the sun; or, in other words, that stars close to the sun would look as if they had moved a little away from the sun, and from one another. This is a thing which cannot normally be observed since such stars are rendered invisible in daytime by the sun’s overwhelming brightness; but during an eclipse it is possible to take pictures of them. If the same constellation is photographed at night one can measure the distances on the two photographs, and check the predicted effect.

Now the impressive thing about this case is the risk involved in a prediction of this kind. If observation shows that the predicted effect is definitely absent, then the theory is simply refuted. The theory is incompatible with certain possible results of observation—in fact with results which everybody before Einstein would have expected.” [5]

The fact that Einstein’s theory passed this risky test provided firm corroboration with which to accept special relativity as a central explanatory concept of modern physics.

Despite the appealing sound of the word “irrefutable,” a theory without some criterion of refutation is indistinguishable from an article of faith, or a sales pitch. Popper’s conception is more precise:

“The criterion of falsifiability... says that statements or systems of statements, in order to be ranked as scientific, must be capable of conflicting with possible, or conceivable, observations.”

The primary task of this analysis then is to measure the NIST case against this criterion and see if the case is in fact capable of conflicting with possible or conceivable observations.

We should of course confine our theories to the existing evidence at hand. When one appeals to the lack of evidence to support a position, there is no end to what one may claim, but it will of course be without foundation.

‘research program’ affecting core scientific theories as it is a single explanation presumably based upon existing physical principles—falsificationism will work as a sufficient gauge of adequacy. For our purposes, we need only establish a lack of predictive ability of the official theory. The division between Kuhn’s approach to theoretical revision and Popper’s falsificationism bears little relevance to theories that are essentially useless. For a more complete elucidation of the demarcation problem, see Lakatos, I., “Proofs and Refutations”, (1976) and Kuhn, T., “The Structure of Scientific Revolutions”, (1962).

[5] Popper, K., “Science, Pseudo-Science and Falsifiability”, (1962). (All bold emphasis in this, and subsequent quotations, is ours—not that of the original authors.)

http://www.kenrahn.com/jfk/critical_thinking/Science_pseudo_falsifiability.html

Interpreting the NIST Theory of Collapse

According to the NIST explanation, chapter 2, section 10 of the Final Report, there were 7 major contributing factors to the collapse of the north tower (WTC 1):

- 1. Structural damage from the aircraft impact;*
- 2. Large amount of jet fuel sprayed into the building interior, that ignited widespread fires over several floors;*
- 3. Dislodging of Spray-applied Fire-Resistive Material (SFRM) from structural members due to the aircraft impact, that enabled rapid heating of the unprotected structural steel;*
- 4. Open paths for fire spread resulting from the open plan of the impact floors and the breaking of partition walls by the impact debris;*
- 5. Weakened core columns that increased the load on the perimeter walls;*
- 6. Sagging of the south floors, that led to pull-in forces on the perimeter columns; and*
- 7. Bowed south perimeter columns that had a reduced capacity to carry loads.[6]*

The crux of the collapse explanation by the NIST theory rests on the weakening of the steel by office material fires, ignited by the jet fuel, which heated exposed steel surfaces to “critical” temperatures. The NIST theory may thus be fairly described as a Heat-Induced Collapse Theory (HICT).

The HICT takes several wordings throughout the NIST manuscript. Here are a few of them:

“Following the impact of the aircraft, the jet-fuel-ignited fires created the sustained and elevated temperatures that heated the remaining building structure to the point of collapse initiation.” (NCSTAR 1, 121)

Specifically in relation to the collapse of WTC 1, they say,

“... the fires weakened the core columns and caused the floors on the south side of the building to sag. The floors pulled the heated south perimeter columns inward, reducing their capacity to support the building above. Their neighboring columns quickly became overloaded as columns on the south wall buckled. The top section of the building tilted to the south and began its descent. The time from aircraft impact to collapse initiation was largely determined by how long it took for the fires to weaken the building core and to reach the south side of the building and weaken the perimeter columns and floors.” (NCSTAR 1, xxxviii)

In relation to the south tower (WTC 2), they report a similar process. (NCSTAR 1, xxxviii)

[6] Sunder, S., W. Grosshandler, H.S. Lew et al., National Institute of Standards and Technology, Gaithersburg, MD, “NIST NCSTAR 1 Federal Building and Fire Safety Investigation of the World Trade Center Disaster” pg. 34, (9/2005).

And later in the Final Report (NCSTAR 1, 185),

“Column buckling over an extended region of the perimeter face ultimately triggered the global system collapse as the loads could not be redistributed through the hat truss to the already weakened building core. As the exterior wall buckled (south face for WTC 1 and east face for WTC 2), the column instability propagated to adjacent faces and caused the initiation of the building collapse. **Perimeter wall buckling was induced by a combination of thermal weakening of the columns, inward pull forces from sagging floors, and to a much lesser degree, additional axial loads redistributed from the core.**”

What we have seen are several anecdotal formulations that give no specific parameters of temperature and time. We must seek evidence to support the claimed sequence of events. What specific effect caused the bowing of the exterior columns? How hot did the core columns have to get in order to contribute to the collapse sequence? How did the collapse mechanisms differ from Tower 1 to Tower 2?[7] Did the simulations accurately represent the conditions in the towers? How many floor trusses had to fail simultaneously in order to initiate the sagging of a single floor? In summary, how does NIST substantiate the central premise of a heat-induced collapse upon which its simulations are based, and is the HICT the most powerful theory available to account for all the evidence at hand?

Metallurgical Analysis

One might think the recovered steel would give the most substantial evidence to support the claim of heat-induced collapse. We are led to believe that NIST has recognized this and has collected the necessary samples for forensic analysis:

“The NIST inventory **included pieces from the impact and fire regions**, perimeter columns, core columns, floor trusses...” (NCSTAR 1.3, xxxvii)

However, on pages 180, and 181 of the Final Report NIST reveals that

“**None of the recovered steel samples showed evidence of exposure to temperatures above 600 °C for as long as 15 min.** This was based on NIST annealing studies that established the set of time and temperature conditions necessary to alter the steel microstructure.”

[7] Interestingly, NIST posits nearly identical collapse explanations for both WTC towers:

“The results of the global analysis of both WTC 1 and WTC 2 showed that global collapse of both towers was initiated by the instability of the exterior walls pursuant to their excessive inward bowing which progressed horizontally to adjacent walls.” (NCSTAR 1-6D, iv), Gross, John. L., et. al., “NIST NCSTAR 1-6D Global Structural Analysis of the Response of the World Trade Center Towers to Impact Damage and Fire” (9/2005)

Here, as in other instances, the NIST authors only differentiate the building collapse mechanisms by which side of the building the theorized effects were taking place. However, the Executive Summary of the FEMA/BPAT study poses a very different interpretation of the events: “... *the collapse of these symbolic buildings entailed a complex series of events that were not identical for each tower.*” (FEMA 403 ES, 2)

With an adroit switch of focus NIST takes this failure to discover heat-affected steel as supporting the official story, saying that

“These results provide some confirmation of the thermal modeling of the structures, since none of the samples were from zones where such heating was predicted.”
(NCSTAR 1, 181)

This contradicts the earlier statement that samples had been collected from the fire region. Just as disturbing is the fact that this lack of directly corroborative evidence for thermal failure is interpreted as validation of their thermal modeling simulations. It well might be confirmation of their modeling, but where is the evidence that confirms the higher temperatures in the buildings, essential to their explanations of the collapse? It may indeed have existed, however the problem the NIST approach immediately highlights is that the HICT relies on the existence of evidence *that has not been found*. To avoid having to revise the HICT, NIST requires us to accept that more severely fire-damaged steel existed despite the failure of the investigation to find any. They stated that they had investigated the “fire regions” and one would assume that they had searched diligently. Already the theory appears to have taken precedence over the evidence.

As for the exterior columns, NIST reports that

“Only three [out of 171] of the recovered samples of exterior panels reached temperatures in excess of 250 °C during the fires or after the collapse. This was based on a method developed by NIST to characterize maximum temperatures experienced by steel members through observations of paint cracking.” (NCSTAR 1, 181)

NCSTAR 1-3C, “Damage and Failure Modes of Structural Steel Components”, gives more specific data concerning the analysis of recovered steel. Although they restate the official conclusions, they also contain a revealing insight into the formation and substance of the HICT. On page 224, referring to tests of spandrel steel, NIST reports:

“After only 15 minutes of exposure at 625°C, the pearlite showed signs of spheroidization. As this feature was not observed in any of the four spandrel materials evaluated, it was believed that the spandrels were not exposed to this temperature or that if they were, it was for significantly less time than 15 minutes.

As the spandrels link the closely-spaced perimeter columns it is reasonable to believe that the columns would have experienced similar, unexceptional temperatures.

And again from sub-report NCSTAR 1-3 an echo of the findings in NCSTAR 1-3C above:

“Annealing studies on recovered steels established the set of time and temperature conditions necessary to alter the steel microstructure. Based on the pre-collapse photographic evidence, the microstructures of steels known to have been exposed to fire

were characterized. **These microstructures show no evidence of exposure to temperatures above 600° C for any significant time.**” [8]

In the next paragraph we see a repetition of the paint cracking findings of the core columns.

“Similar results, i.e., limited exposure if any above 250° C, were found for the two core columns recovered **from the fire-affected floors of the towers**, which had adequate paint for analysis.

So far, this is just a restatement of the summary in the Final Report; however, this statement is followed by a curious qualification:

Note that the perimeter and core columns examined were very limited in number and cannot be considered representative of the majority of the columns exposed to fire in the towers.” (NCSTAR 1-3, xli-xlii)

On what grounds then, can the NIST scientists make a determination of the temperatures achieved by the steel? What evidence are they appealing to? The HICT appears to defer fundamentally to the fact that the collapses occurred, not to the specifics of the forensic investigation.

Lost and Assumed Evidence

Although it remains a possibility that the recovered steel is not representative of steel exposed to the hottest temperatures, claims of this nature are pure speculation, conjecture or wishful thinking. NIST does not explicitly say they are assuming the existence of directly corroborative forensic evidence where none has been found, but the assumption is implicit in their argument.

It remains a possibility that all directly corroborative evidence was removed during cleanup. *It also remains a distinct possibility that it never existed.* This latter very real possibility is never acknowledged in the NIST report. NIST’s theory requires *certainty* in the premise that floor trusses were exposed to temperatures high enough to cause substantial sagging and thereby pull in, and cause bowing, of the heat-affected external columns, but this remains unsubstantiated speculation.

Clearly, we should now bear in mind the possibility that the HICT may not be the most powerful explanation, as we look for experimental corroboration in tests. If the tests are properly designed, and the theory is well grounded, we should find evidence for the failure modes predicted by the HICT in these tests.

Floor Truss System Tests

NIST contracted Underwriters Laboratories to rebuild 4 floor truss sections to original

[8] Gayle, F.W. et al., “NIST NCSTAR 1-3 Mechanical and Metallurgical Analysis of Structural Steel” pg. xli, (9/2005) and Barnett, J.R., R.R. Biederman, and R. D. Sisson Jr., “An Initial Microstructural Analysis of A36 Steel from WTC Building 7”, <http://www.tms.org/pubs/journals/JOM/0112/Biederman/Biederman-0112.html>

specifications, seemingly for the purpose of corroborating their collapse theory. Underwriters Laboratories performed four tests which incorporated six variables:

1. Truss span: 17 ft or 35 ft
2. SFRM thickness: 3/4 inch or 1/2 inch
3. Restrained (unable to flex with expansion) or unrestrained

All four tests incorporated the full design load. In an effort to keep the results scaled for the shorter lengths, the load assigned to them was doubled.

What they found was that

“All four test specimens sustained the maximum design load for approximately 2 hours without collapsing.” (NCSTAR 1, 143)

In the opening pages, NIST confirms that

“...in all cases, the floors continued to support the full design load without collapse for over 2 hours.” (NCSTAR 1, xli)

This surprising admission naturally arouses concern. We must investigate further to determine why this finding that the floors did not collapse in the test was deemed to be irrelevant. First we need to know the temperature the steel reached and for how long it was maintained. We find this in the graph below (NCSTAR 1-6B, 101).

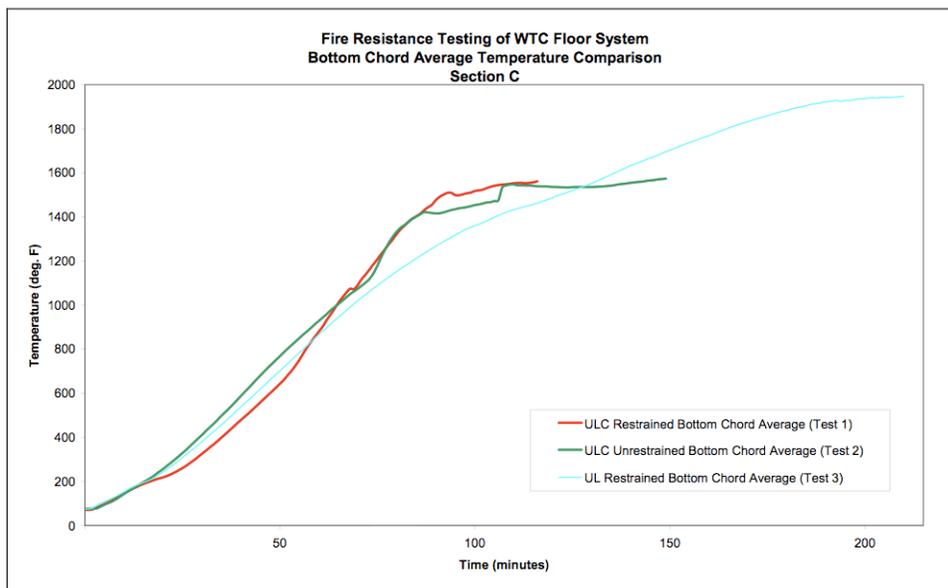


Figure 6–4. Average temperatures of the bottom chord for Test Nos. 1, 2, and 3 (3/4 in. thick SFRM).

At 100 minutes, the graph shows the temperature of the steel of the bottom chord of the truss for all three floor sections to be between approximately 1300 °F and 1500 °F (704 °C and 815 °C).

The temperature increases at varying rates from this point until the termination of the tests, all eventually exceeding 1500 °F.

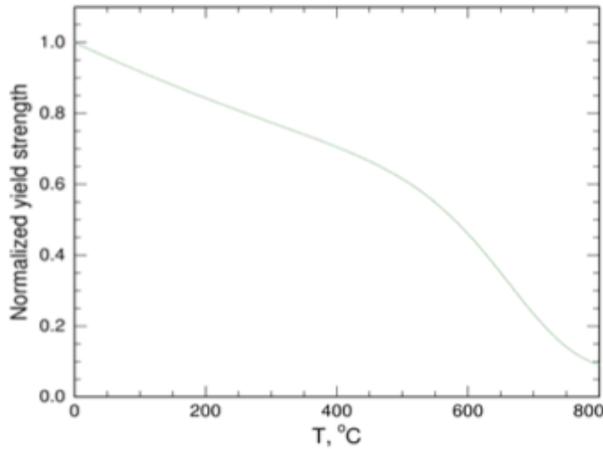
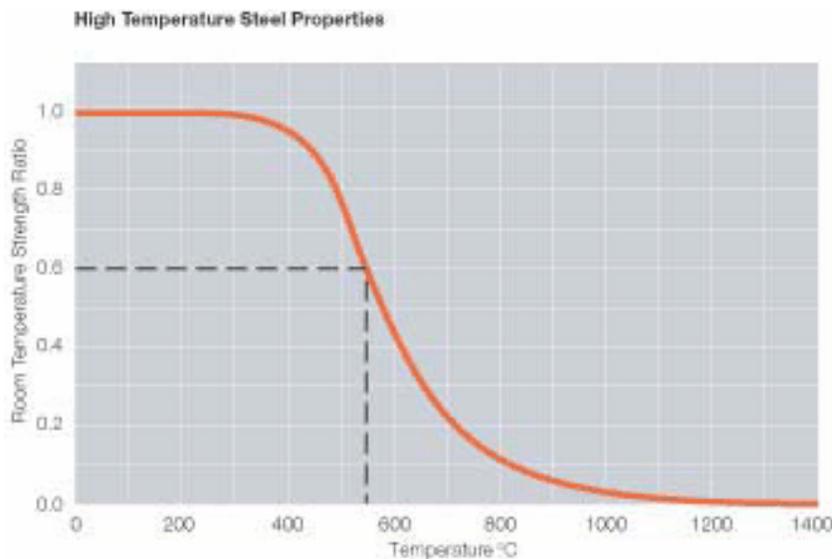


Figure 2–9. Temperature dependence of yield strength of structural steel as a fraction of the value at room temperature.

We see from their Figure 6-4, and Figure 2-9 (NCSTAR 1, 30), that the bottom steel chords in the laboratory tests had no more than 10% of their original strength, yet the trusses did not collapse. It is also of interest to note that NIST’s Figure 2-9 appears to grossly exaggerate the loss of strength in the early stages of heating, as shown by comparison with the graph below.[9] NIST may have been motivated to show a misleading graph as they had found very little steel which had been heated to high temperatures. The truncation of NIST’s graph at 800 °C also obscures the fact that steel retains useful strength at even higher temperatures. Clearly survival is possible if the load is light and may also be possible in situations where ductility permits the transfer of load to adjacent members. This may have contributed to the surprising survival demonstrated in NIST’s tests.



[9] http://www.corusconstruction.com/en/design_guidance/structural_design/fire/steelwork_fire_resistance/

There is also a presumption in the NIST theory that the floors in the building would fail at the same temperature as the test trusses would fail. This presumption cannot be sustained as the test trusses were loaded to the maximum design capacity, (104 pounds per square foot for the full length 35 foot trusses, NCSTAR 1-6, 4.1) but no evidence is presented to show that the floors in the buildings would have been loaded so heavily. Indeed it is reasonable to believe that the contents of typical offices would not load floors to anywhere near the maximum design load. A typical filing cabinet might weigh 150 pounds with an area of 3 square feet, thus applying 50 pounds per square foot, far less than the design load. Furthermore office floors are never entirely covered with filing cabinets. Once again we find evidence essential to the official argument is absent.

Since none of these floor truss systems collapsed, we can infer one of three things:

1. Either thermal conditions in the towers exceeded the conditions in the tests, or
2. The tests did not successfully reproduce the conditions in the towers, or
3. The HICT is an inadequate explanation for the collapse of the towers.

We can rule out the first inference on the grounds that hydrocarbon and office material fires simply do not burn any more intensely than the test provided. Nor can they remain intense for long in any one place: they must decline as the fuel is consumed. This is not a point of controversy as it was pointed out by NIST itself.[10]

As for the second inference, proponents of the official version claim that the tests did not reproduce the conditions in the towers because they did not incorporate some variables, and imply that they are therefore useless in making inferences about the adequacy of the HICT. This criticism refers to two factors: the existence of insulation in the form of Spray-Applied Fire-Resistive Materials (SFRM) in the tests and the lack of structural damage in the tests, such as might have been caused by plane impact.

Regarding the presence of SFRM in the test NIST says

“..., the towers withstood the impacts andwould have remained standing were it not for the dislodged insulation (fireproofing) and the subsequent multi-floor fires.”
(NCSTAR 1, xxxvii, 175)

Fireproofing, however, serves only to slow the rate at which steel gains heat and does not change the load-bearing properties of steel at any particular temperature. The tests already described were reporting the actual temperature of the steel, not the temperature of the surface of the insulation and not that of the environment. The heating was maintained long enough for the steel to achieve temperatures high enough to reduce essential portions of the steel structures to 10% of

[10] “NIST’s tests found that peak temperatures were reached in 20-30 minutes, and that temperatures were below 600C shortly thereafter.... Therefore, if they were at all similar to fires in the multiple workstation tests, they should have done their damage within the first half hour—long before either tower 1 or 2 fell.” Douglas, E., “The NIST WTC Investigation-- How Real Was The Simulation?”, <http://journalof911studies.com/volume/200612/NIST-WTC-Investigation.pdf>, and NCSTAR 1-5, p 140, 'Reconstruction of the Fires in the World Trade Center Towers'.

the room temperature values. The argument that the tests should be dismissed because of the presence of SFRM therefore fails.

The argument based on impact damage also fails. Although NIST regards the impacts as a contributing factor to the collapses in other parts of their analysis, they fully acknowledge their inability to substantiate this position regarding the floors with any evidence.[11]

In the absence of forensic evidence we turn to their simulation. We note that Figure E-42 in NCSTAR 1-2, of the most damaged floor in WTC 1, (more severe case), shows no damage whatsoever on the south side. This is relevant because it is on the south side that the floors were said to sag and pull the exterior columns inward, ultimately initiating the collapse by bowing the external columns inward. Once again we are asked to accept an assertion without evidence.

That leaves only the third option, that the HICT is inadequate. However, before we condemn the official version outright, we look more closely at the laboratory results for any possible support.

Test 3

The length of Test 3, (3.5 hours), allows us to remove any doubt surrounding the SFRM factor in keeping the trusses at a lower temperature than exposed members (NCSTAR 1-6B, 76).

Let us examine the last stages of the test. At this time, the steel is over 800 °C in the west trusses and over 1000 °C in the east trusses. These trusses operated at below 10% of their optimal strengths for 40 to 60 minutes, as shown in the graph below. One would have expected immediate failure, but this did not occur, providing another glaring indication that something might be wrong with the HICT theory proposed by NIST.

[11] *“After the building withstood the initial aircraft damage, the timing of the collapse was largely determined by the time for the fires to weaken the perimeter columns and floors on the east and south sides of the building. **That the aircraft impact damage to the core was more severe in WTC 2 than in WTC 1 contributed to the shorter time to collapse.**”* (NCSTAR 1, 46)

It is unclear, however, how the NIST researchers came to the above determination since they provide several statements indicating the limits of the empirical data:

*“Assessment of the accuracy of the predictions of damage inside the buildings was more difficult, as **NIST could not locate any interior photographs near the impact zones.**”* (NCSTAR 1, 46)

*“**NIST could not locate any photographic evidence** regarding the fire exposure of the building core or the floor assemblies.”* (NCSTAR 1, 116)

*“**Fires deeper than a few meters inside the building could not be seen** because of the smoke obscuration and the steep viewing angle of nearly all the photographs.”* (NCSTAR 1, 127)

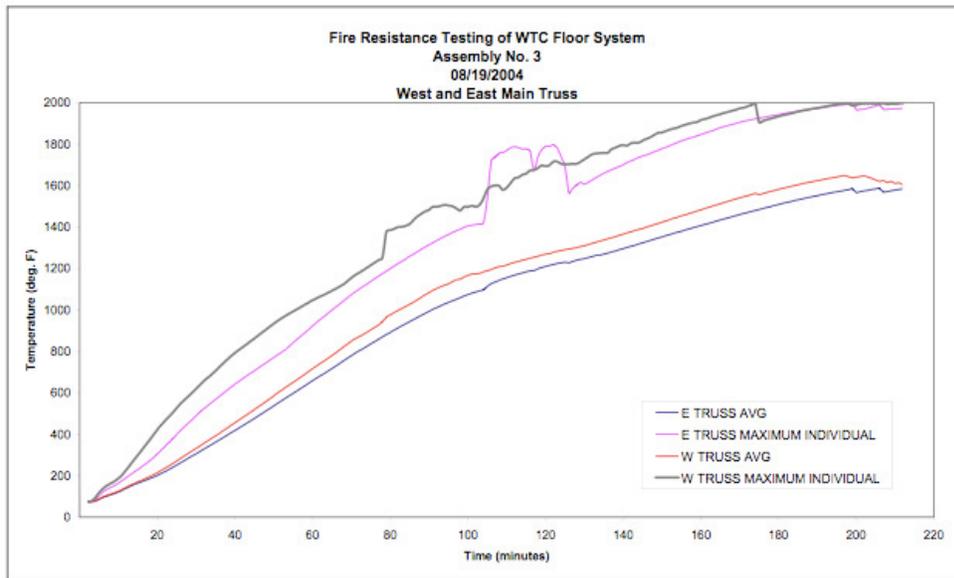


Figure 5-40. Assembly No. 3 – overall average and maximum individual temperatures on west and east main trusses.

We cannot get around the fact that test 3 held up at a temperature far exceeding any for which NIST provided evidence in either tower, even in the simulations, and far above any reasonable temperature from office fires.

Given the severely weakened steel in this test for a substantial period, should we not have seen the test trusses sag at least as far as was relied upon in the simulations, 42 inches? The maximum sag reported was about 9 inches. A sag of 9 inches can hardly have had a significant effect on the perimeter columns. Why does this test not count as a definitive counterexample to the HICT?

Since test 3 spanned only 17 ft and the shortest floor trusses spanned 35 ft, NIST disregards the results on the grounds of scalability concerns. In their words:

“For assemblies with a $\frac{3}{4}$ in. SFRM thickness, the 17 ft assembly’s fire rating was 2 hours; the 35 ft assembly’s rating was 1½ hours. This result raised the question of whether or not a fire rating of a 17 ft floor assembly is scalable to the longer spans in the WTC towers.” (NCSTAR 1, 143, 186)

If the scalability concern is indeed well founded, we should see corroboration for heat-induced failure modes in the 35 ft floor truss test in Test 2.

Test 2

This test lasted for 146 minutes and was terminated after failure of the sensors. If the HICT, championed by NIST, has any value whatsoever in predicting the likely products of heat and steel under load, then a steel temperature of 800 °C should be enough to provoke at least one of the failure modes predicted by the official scenario. However, no failure is documented for test 2. These results cannot be ruled out due to scalability concerns because test 2 was, in fact, modeled on an actual floor truss without scaling. Nor can these results be ruled out based on the presence

of SFRM because it was the steel temperature, not the gas or insulation temperature, which was measured.

The NIST study therefore falls on the horns of an uncomfortable dilemma. Either:

1. A testable hypothesis exists and has been proven false, or
2. No testable hypothesis exists.

If no testable hypothesis exists, then the official story is nothing more than an armchair suggestion—the motivation of which is questionable. For the hypothesis to continue to be worth considering, NIST must show why the tests were not appropriate, even though they had designed them themselves. This they attempted to do:

“The Investigation Team was cautious about using these results directly in the formulation of collapse hypotheses. In addition to the scaling issues raised by the test results, the fires in the towers on September 11, and the resulting exposure of the floor systems, were substantially different from the conditions in the test furnaces.” (NCSTAR 1, 143)

The scaling issue has already been dismissed. It is true that the 17-foot trusses performed better than the 35-foot trusses, however the difference was marginal and would be overwhelmed by the fact that the test trusses were loaded to the design maximum, which must be much greater than the real load on the day. The thermal exposure of the floor systems in the towers was indeed substantially different from the tests in that the laboratory temperatures would have been much higher than any possible temperatures reached in the towers. We therefore find the attempt to dismiss the relevance of the floor truss tests unconvincing. As if to acknowledge our interpretation, NIST states:

“Nonetheless, the results established that this type of assembly was capable of sustaining a large gravity load, without collapsing, for a substantial period of time relative to the duration of the fires in any given location on September 11.” (NCSTAR 1, 143)

This remarkable concession exposes the basis of their approach. NIST apparently already “knew” the cause of the collapse and could therefore proceed with their explanation despite the failure of controlled tests to corroborate the HICT and despite the lack of forensic evidence of high temperatures to substantiate it. NIST reported that they terminated two of the four laboratory truss tests because they were facing “imminent collapse” on no apparent grounds other than the circular structure of their case, which they assert must inevitably culminate in the failure of the buildings.[12] They could just as truthfully have stated that the test trusses *did not fail due to heat* as the phrase “imminent collapse” equally means that the trusses at that time had not collapsed. This phrase would be regarded by many as “spin”. The NIST argument appears to have moved from the scientific realm into the realms of faith, doctrine or propaganda.

[12] The NIST authors invoke the use of “imminent collapse” as reason to terminate tests 1 and 4, however, no operational definition of this phrase is ever offered.

Others have found inconsistencies in the way NIST interpreted their own data. Eric Douglas points out that NIST appears to ignore their own finding that fires maintained high temperatures for only short periods in any one place.[10] They also appear to have totally ignored the results of their own simulations of temperatures in the towers. Most clearly, in the case of the north tower, we see that the steel was apparently either too cold to collapse or was cooling at the time of collapse. If cooling, it had survived its most vulnerable period, and thus collapse from thermal failure had become impossible.[13]

Computer Simulations

When neither the laboratory tests nor the evidence from the recovered samples corroborate the HICT, NIST turns to computer simulations to make its case. What is the empirical basis for the simulations? Do the simulations correspond to the available evidence at hand? Let us look deeper.

Contrary to their own interpretation of events, in section 6.10.4 of the Final Report, the NIST authors note that

“..... At any given location, the duration of temperatures near 1,000 °C was about 15 min to 20 min. The rest of the time, the calculated temperatures were near 500 °C or below.” (NCSTAR 1, 129)

The problem then is how could an entire floor truss section get to 700 °C when “at any given location” temperatures were only briefly very hot? Also bear in mind that multiple trusses would have to fail simultaneously before any significant effect on the perimeter columns could be expected. This is because the trusses are tied together by the floor structure and the external columns are strongly interlocked by the spandrels.

Moreover, the simulation predicted other component failures at particular temperatures:

“At 566 °C, the interior truss seat bolts sheared off, without loss of vertical support. At 670 °C, the gusset plate at the exterior truss seat fractured, followed by shearing of the exterior seat bolt. At 730 °C, the truss walked off the exterior truss seat.” (NCSTAR 1-6C, 81)

Once again, if these temperatures were sufficient to cause such destruction, why did the floor truss tests exhibit none of these failure modes given laboratory steel temperatures and exposure times exceeded those in the simulations? The finding in the simulation that the truss end-connections failed is strikingly inconsistent with the claim NIST relied upon that the sagging floor pulled the perimeter columns inward. Despite the contradiction of their simulation by the tests, the NIST investigators made no attempt to adjust their conclusion.

[13] Legge, F., “NIST Data Disproves Collapse Theories Based on Fire”, http://journalof911studies.com/articles/Article_6_Pancake_theory_false_by_NIST_WorldTradeCenter.pdf

The Three Cases and the Circular Argument

NIST also employed simulations that were designed to re-create the collapse initiations on a larger, total-building scale. Originally, three cases each for WTC 1 and 2 were developed:

“The Investigation Team then defined three cases for each building by combining the middle, less severe, and more severe values of the influential variables. **Upon a preliminary examination of the middle cases, it became clear that the towers would likely remain standing.** The more severe case (which became Case B for WTC 1 and Case D for WTC 2) was used for the global analysis of each tower.” (NCSTAR 1, 144)

NIST here appears to admit that it selected the “more severe” case for no reason other than that it was the only one of the three cases they created that would result in collapse. The simulation thus has become a circular argument in that it assumes what it should have set out to prove. A more honest report would have stated that two out of three of their best estimates of likely damage due to heat had failed to produce collapse and would have then gone on to examine other possible causes of failure for comparison. This issue is explored in detail in the Request for Correction to the NIST report and the subsequent Appeal.[3]

Contrary Evidence Ignored

In addition to the apparent failure of the NIST report to base their theory on the forensic evidence and the test data—preferring artificially intensified simulated data instead—they must also characterize other evidence as irrelevant.

The most damning evidence to contradict the HICT is found in videos of the collapse and in the dust which spread out as the buildings collapsed. The special significance of these sources of evidence is that they are in public hands and cannot now be taken away. In particular the videos can be easily studied by members of the public and appropriate calculations performed.

It will be a surprise to many readers to learn that NIST did not simulate the collapse of the towers. The simulations were stopped at the “point of collapse”. The entire HICT theory rests on the assertion by Bazant and Zhou that the initiation of the collapse was sudden, permitting the top block of the building to fall with full gravitational energy on the undamaged portion below. However steel loses strength gradually as its temperature rises and sagging would be expected. Furthermore once distortion has commenced, steel hardens, thus more time is required to enable more heat to be added. The initial movement must therefore be slow. No such slow initial movement can be observed in the videos; they show constant acceleration from the outset.[14] It is also very clear in the videos that the top portion does not fall as an intact block but disintegrates. It therefore cannot provide the impact energy postulated by Bazant and Zhou to destroy the unheated, undamaged lower portion of the building. Furthermore, if such an energy-

[14] Legge, F. and T. Szamboti, “9/11 and the Twin Towers: Sudden Collapse Initiation was impossible”: http://journalof911studies.com/volume/200703/Sudden_collapse_initiation_impossible.pdf

delivering impact occurred, the falling block would exhibit a sudden reduction in acceleration, but this was not observed.[15]

Even if it were true that fuel fires initiated the fall, the potential energy of the buildings cannot provide the energy required to pulverize the concrete and hurl massive steel members into buildings as far as 500 feet away. This is because most of the potential energy would be consumed in providing the observed downward acceleration of the buildings. Energy consumed in one task it is not available for another.[16]

David Chandler has recently shown that, even if the energy required to pulverize the concrete and hurl the steel outward is completely ignored, the rate of collapse indicates that the columns in the lower, undamaged section of the buildings were exerting an upward force of only about one third of the force due to gravity. As they were designed with a safety factor sufficient to support over three times the force of gravity it is clear that something has suddenly reduced their strength to about 10% of their design strength.[17] The HICT does not offer any explanation for this sudden loss of strength in the lower portion of the buildings. The HICT also does not address the highly improbable symmetry of the three collapses.[18]

Possibly the most damning evidence to date for unaccounted energy sources has been brought to bear by Dr. Steven Jones, the former BYU physics professor, and colleagues. A survey of the professor's previous work in physics demonstrates a cautious epistemic stance. His analysis of the evidence in this case is no less cautious. Also working in the same area are Dr. Niels Harrit and colleagues. Professor Harrit has a distinguished career working with nano technology at the University of Copenhagen, Denmark. Their work is noted in points 4 and 5 in the following list.

At least five distinct forensic data sets indicating temperatures impossibly high for fires of oil and jet fuel remain unexplained by the NIST researchers:

1. Some recovered structural members exhibiting "high temperature corrosion and sulfidation attacks" were reported by FEMA.[19]
2. Corroborated accounts of molten steel in the debris piles of WTC 1, 2 and 7, by supporters of the official version, who were present at the destruction site, as well as

[15] MacQueen, G and T. Szamboti, "The Missing Jolt: A Simple Refutation of the Bazant – NIST Collapse Hypothesis": <http://journalof911studies.com/volume/2008/TheMissingJolt7.pdf>

[16] Kuttler, K., "Collapse Time Calculatons for WTC 1":
<http://journalof911studies.com/letters/ProfKuttlerWTC1CollapseTimeCalculations.pdf>

[17] David Chandler on WTC 1,
<http://journalof911studies.com/volume/2010/ChandlerDownwardAccelerationOfWTC1.pdf>
<http://www.youtube.com/user/DavidChandler911#p/c/3705E482383CCA91/2/ZjSd9wB55zk>

[18] Legge, F., "9/11 – Proof of Explosive Demolition without Calculations",
http://journalof911studies.com/volume/2007/LeggeVerticalCollapseWTC7_6.pdf

[19] Barnett, J., R. Biederman et al., "FEMA 403 Appendix C Limited Metallurgical Examination" (2002)
http://wtc.nist.gov/media/AppendixC-fema403_apc.pdf

the video evidence of molten metal pouring from WTC 2 shortly before collapse.[20,21]

3. Aerial survey by USGS shows exceptional “hot spots” 5 days after the attack.[22]
4. The discovery of iron-rich microspheres in the dust, reported by Prof. Jones and colleagues,[23] and by two groups unconnected with Prof. Jones.[24]
5. The discovery of red chips with the characteristics of unreacted aluminothermic agents in the dust, recently reported by Prof. Harrit and co-workers.[25]

Regarding the sulfidation attack, point 1 above, the paper on extremely high temperatures, recently posted at the Journal of 9/11 Studies,[23] provides an argument that the reaction could not have happened in the debris pile. This argument is based on the fact that sulfur evaporates at a temperature far below the required reaction temperature and thus could not remain available in the debris pile. The implication is that the reaction must have been extremely rapid, as occurs in the nano-aluminothermite type reactions documented by Harrit and others.[25]

Regarding the reports of molten metal, it has been pointed out by Eagar and Musso, among others, that “the temperature of the fire at the WTC was not unusual, and it was most definitely not capable of melting steel.”[26] Although their statement is made in an attempt to reaffirm the HICT from another standpoint, it serves to categorically rule out the possibility that temperatures in such a fire could have melted steel or caused sulfidation. Analysis of the microspheres shows that they were predominately iron but contained small amounts of elements expected from an aluminothermic reaction. Being spherical, the metal must once have been molten. Their small size indicates that something violent occurred.

[20] In the online publication WasteAge.com, writer Tom R. Arterburn comments, “But for about two and a half months after the attacks, in addition to its regular duties, NYDS played a major role in debris removal — everything from molten steel beams to human remains ...” http://wasteage.com/mag/waste_dday_ny_sanitation/

[21] Trudy Walsh, reporting for Government Computer News, quotes Greg Fuchek, an employee of LinksPoint Inc. as saying, “In the first few weeks, sometimes when a worker would pull a steel beam from the wreckage, the end of the beam would be dripping molten steel.” http://www.gcn.com/print/21_27a/19930-1.html?topic=news

[22] USGS survey report, <http://pubs.usgs.gov/of/2001/ofr-01-0405/ofr-01-0405.html>

[23] Jones, S. et al., “Extremely high temperatures during the World Trade Center destruction” <http://journalof911studies.com/articles/WTCHighTemp2.pdf>

[24] USGS. “Particle Atlas of World Trade Center Dust”, <http://pubs.usgs.gov/of/2005/1165/508OF05-1165.html>

Lee, R.J., contracted to investigate the dust in the Deutsche Bank, “Damage Assessment 130 Liberty Street Property”, <http://www.nyenvirolaw.org/WTC/130%20Liberty%20Street/Mike%20Davis%20LMDC%20130%20Liberty%20Documents/Signature%20of%20WTC%20dust/WTC%20Dust%20Signature.Composition%20and%20Morphology.Final.pdf>

[25] Harrit, N. et al, “Active Thermitic Material Discovered in Dust from the 9/11 World Trade Center Catastrophe”, <http://www.bentham-open.org/pages/content.php?TOCPJ/2009/00000002/00000001/7TOCPJ.SGM>

[26] Eagar, T.W., and C. Musso. “Why Did the World Trade Center Collapse? Science, Engineering, and Speculation”, Presentation on WTC Collapse, Civil Engineering Department, MIT, Cambridge, MA (10/3/ 2001) <http://www.tms.org/pubs/journals/JOM/0112/Eagar/eagar-0112.html>

The HICT is ill equipped to deal with these pieces of evidence. They are not included in the scope of the NIST investigation. In the case of the iron-rich microspheres examined by the USGS, NIST takes no notice whatsoever. In regard to photographic and video evidence, as well as eye-witness accounts of molten metal, NIST categorizes all such accounts as molten aluminum, despite its well known high reflectivity and low emissivity, which gives a different appearance in daylight. This was demonstrated by Jones in his attempts to replicate NIST's explanations.[27] The NIST assertion that the flowing metal is aluminum therefore fails the test of repeatability in the hands of others, and NIST is either unable or unwilling to perform replicable experiments to corroborate its assertion.

With each additional failure of logic, it becomes increasingly difficult to allow that the deficiencies might be due to simple oversight. Nor can the failure to investigate the obvious possibility that explosive demolition might better fit the evidence be attributed to lack of knowledge of such matters, as NIST has been working with groups engaged in research on nanothermite materials at least since 1999.[28]

Psychological Considerations

Even though NIST's explanation appears to be either false or useless in explaining the events of September 11, 2001, government complicity does not necessarily follow, but if official explanations fail to cohere with the known evidence, the possibility of government complicity must at least be explored. This is dangerous theoretical territory because it requires us to come to terms with distressing possibilities.

The NIST report was produced by skilled scientists and technicians, hence it seems likely that many of them would have themselves generated the arguments presented here. The fact that they did not utilize such arguments implies either that some political pressure was put upon them to underplay the significance of particular findings or that, as an agency of the Department of Commerce, they simply had no say in the content of the report. Any attempt to explain the inconsistencies and shortcomings within the report as simultaneous incompetence by hundreds of scientific professionals is patently implausible.

Many Americans appeal to the admittedly complicated logistics of a planned operation to destroy the towers with explosives as a means to avoid considering the evidence altogether. Arguments from logistical complexity, however, do not serve to reconcile the evidence with official theory. Indeed, these arguments offer no explanation of the collapses whatsoever. For many they serve merely as psychological defense mechanisms, the essential purpose of which is to protect the individual from having to confront the relevant evidence from the outset. Although government complicity does not necessarily follow from the observations listed here, a detached evaluation of the evidence simply cannot rule it out.

[27] Jones, S.. "Revisiting 9/11/2001 --Applying the Scientific Method" (2006), <http://journalof911studies.com/volume/200704/JonesWTC911SciMethod.pdf>

[28] Ryan, K.R., "The Top Ten Connections Between NIST and Nano-Thermmites", http://journalof911studies.com/volume/2008/Ryan_NIST_and_Nano-1.pdf

Conclusion

Many of these criticisms of the NIST report could fairly be dismissed if subsequent reviews had provided explanations of apparent contradictions and thus had produced a testable hypothesis that coincided with the real-world data. This has not occurred. Despite possession of all the resources available in the \$20M study, NIST adheres to an explanation for the collapses which is basically circular and fails at critical points. It is unable to produce forensic evidence for the required high temperatures; the test results contradict its claims; it is internally inconsistent; it ignores many lines of contrary evidence; and it makes no attempt to search for an alternative explanation.

NIST has resisted attempts to have the report corrected, thus publicly implying that the HICT does not need revision. It is therefore clear that further investigation is urgently required and that it must be independent of the bodies involved in the previous studies.