UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF INDIANA
SOUTH BEND DIVISION

JERID ENTERPRISES, LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	CAUSE NO. 3:10-CV-435 JD
	)	
LLOYD'S LONDON; SKELTON & CARNEGIE INSURANCE SPECIALTY CORPORATION	)	
	)	
Defendants.	)	

OPINION & ORDER

Plaintiff Jerid Enterprises, LLC, ("Jerid") sued defendants Certain Underwriters at Lloyd's London ("Lloyd's") for policy limits after the roof of a South Bend, Indiana, commercial property owned by Jerid and insured by Lloyd's partially collapsed. The dispute centers on the cause of collapse: Jerid's theory is that a lightning strike to pooled water on the roof caused an explosive event through the operation of a phenomenon known as the electrohydraulic effect ("EHE"); Lloyd's believes that rotted load-bearing beams or columns collapsed under the weight of standing water on the roof during a torrential rain. If it is the former, the policy provides coverage. If it is the latter, the policy does not.

The case is scheduled for trial on December 17, 2012. In anticipation thereof, Lloyd's moved to disqualify Jerid's two proposed expert causation witnesses under the Fed. R. Evid. 702 and *Daubert* standards. [DE 44; DE 45]. The first proposed expert, Jerry Mohajeri, is a long-time structural engineer who inspected the collapse site at Jerid's request. The second is Peter Gaitan, the owner-operator of a salvage/reclamation business, who visited the building several times in connection with his anticipated purchase of it for its salvage value. Both concluded that lightning

caused the partial collapse. Jerid responded to Lloyd's motion to bar the Mohajeri testimony [DE 60; DE 61; DE 62; DE 63], but did not respond to the motion to bar the Gaitan testimony. Lloyd's replied [DE 68], and the court took the motions under advisement. After much consideration, the court grants Lloyd's motion to bar expert testimony by Gaitan [DE 45]. The court also conditionally, and partially, grants Lloyd's motion to bar expert testimony by Mohajeri [DE 44], subject to the plaintiff's opportunity to rehabilitate the foundation of his testimony during trial.

DISCUSSION

In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), and subsequent cases, the Supreme Court charged trial judges with the responsibility of acting as gatekeepers to exclude unreliable expert testimony, whether scientific or otherwise. *See Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137 (1999). The proponent of expert testimony bears the burden of establishing that the pertinent admissibility requirements are met by a preponderance of the evidence. *See Bourjaily v. United States*, 483 U.S. 171 (1987); Fed. R. Evid. 104(a). Federal Rule of Evidence 702, as amended in 2000 and 2011 to better reflect the state of the law on the subject, sets out those admissibility requirements. Expert opinions are admissible where:

(1) The witness is qualified as an expert by knowledge, skill, experience, training, or education (*see* Rule 702 introductory phrase);

(2) The expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue (*see* Rule 702(a));

(3) The testimony is based on sufficient facts or data (*see* Rule 702(b));

(4) The testimony is the product of reliable principles and methods (*see* Rule 702(c)); and

(5) The expert has reliably applied the principles and methods to the facts of the case (*see* Rule 702(d)).

Rule 702 is a conjunctive test, so expert testimony must meet all five requirements to be admissible. Failure on any prong is fatal. Each requirement has been thoroughly explored in the case law, and each requires a separate analysis, although the last two are closely related and both deal with the popular *Daubert* factors and their progeny. The court examines the testimony of the plaintiff's proposed experts, Jerry Mohajeri and Peter Gaitan, under each prong of the test in order. In doing so, the court finds that Gaitan must not be permitted to testify as an expert because he is not qualified. Mohajeri is qualified, but there are some problems with respect to the scientific reliability of the final conclusion he draws.

A. Whether the expert is qualified.

The first requirement is that any proposed expert be qualified by knowledge, skill, experience, training, or education. *See* Fed. R. Evid. 702. "'[E]xtensive academic and practical expertise' in an area is certainly sufficient to qualify a potential witness as an expert[.]" *Smith v. Ford Motor Co.*, 215 F.3d 713, 718 (7th Cir. 2000) (quoting *Bryant v. City of Chi.*, 200 F.3d 1092, 1098 (7th Cir. 2000)). So too is extensive and specialized experience, even where it comes without formal schooling. *Id.*; *Kumho Tire Co.*, 526 U.S. at 153 ("[N]o one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience."); *see also* Advisory Committee Notes to Rule 702 ("In certain fields experience is the predominant, if not sole, basis for a great deal of reliable expert testimony."). No matter the path to qualification, however, a witness may only offer an expert opinion within the field as to which he or she is expert-qualified. *Jones v. Elec. Co.*, 188 F.3d 709, 723 (7th Cir. 1999). That means there are two questions at issue: (1) whether the potential witness is qualified as an expert and (2) whether the potential witness's expected opinion testimony falls within his field of expertise.

Lloyd's has not attacked Mohajeri's qualifications as an expert, *per se*. Jerid has tendered Mohajeri as an expert in "structural engineering" [DE 60 at 1], a field which is certainly relevant, as the issue in this case concerns a structural collapse. It is undisputed that Mohajeri is, in fact, a structural engineer. He has a degree from the University of Missouri within the field, and has attended conferences concerning failure analysis and blast failure analysis. He has extensive experience as a structural engineer, including 39 years as the head of MHM Associates, Inc., his consulting firm, and he has previously testified in legal proceedings as to the cause for structural failures. Mohajeri is admittedly not a specialist in electrical engineering or in the study of lightning strikes, but the nature of his analysis in this case – progressively eliminating possible causes for the collapse which were clearly within his realm of technical understanding, until only one possibility is left – is the sort of analysis a structural engineer with training and experience in failure analysis is qualified to do. Indeed, it is the exact same sort of elimination analysis done by Lloyd's own expert engineers in this case. Moreover, "a witness may testify as an expert without a perfect match between qualifications and the scientific issues in the case." *Henderson v. Freightliner*, LLC, 2005 WL 775929 at *16 (S.D. Ind. 2005) (citing *Smith v. Ford Motor Co.*, 215 F.3d 713, 720 (7th Cir. 2000)); *see also Owens v. Amtrol, Inc.*, 94 F.Supp.2d 952, 954-55 (N.D. Ind. 2000). This match is sufficient. It is not uncommon for structural engineers to testify as expert causation witnesses in building collapse cases, even where lightning is a central potential cause. *See, e.g.*, *Guideone Elite Ins. Co. v. Diocese of the Northeast and Mid-Atlantic of the Reformed Episcopal Church*, No. Civ.A. 05-4162, 2006 WL 759711 at *4-5 (E.D. Pa. March 23, 2006); *Simmons v. Allstate Ins. Co.*, No. Civ.A. 96-5112, 1996 WL 728753 at *2 (E.D. Pa. Dec. 18, 1996). The court finds that Mohajeri is qualified by education and experience as an expert in structural engineering and failure analysis and

that the nature of the opinion evidence he intends to offer falls within his area of expertise. His testimony is still subject, of course, to the remaining four requirements of Rule 702.

Gaitan is a different matter. The plaintiff intends to have Gaitan testify that, based on his observation, "the damage was due to a lightning strike to the metal roof drain on the roof." [DE 45-1]. The plaintiff has offered no evidence, however, that such opinion evidence would be within any realm of expertise, or even specialized knowledge, that Gaitan possesses. That does not mean that Gaitan cannot testify at all. For example, he may testify that he never observed any visible rot in supporting timbers during his walk-through of the structure related to his potential purchase thereof, if he can provide the proper foundation for the court to determine he was familiar with the appearance of rot in wooden structures. He does not now appear qualified in any way, however, to testify as a Rule 702 expert as to his opinion that there was an explosion, or that lightning caused any potential explosion. He is not an engineer, a meteorologist, an electrician, or anything else that would give him some special knowledge pertaining to that issue. His only purportedly relevant training and experience includes: his vague recollection of seeing a building after a lightning strike once; his experience taking Meteorology 101; and "hearing from people and seeing and watching on PBS and stuff like that." [DE 45-2 at 8]. That is not enough. The plaintiff has apparently conceded the issue, since Jerid neglected to file a response to Lloyd's motion to bar Gaitan's testimony despite repeated opportunities to do so. Since Gaitan is not qualified to testify as an expert, there is no need to analyze his proposed expert testimony under the remainder of Rule 702's requirements. The rest of this order will deal exclusively with Mohajeri's proposed testimony.

B. Whether the expert's technical knowledge will be helpful to the jury.

The second requirement is that the expert's scientific, technical, or other specialized knowledge should help the trier of fact to understand the evidence or to determine a fact in issue. *See* Fed. R. Evid. 702(a). This, the Supreme Court has explained, is essentially a relevance inquiry. *Porter v. Whitehall Labs., Inc.*, 9 F.3d 607, 613 (7th Cir. 1993) (citing *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 591 (1993)). "Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." *Daubert*, 509 U.S. at 591 (citing 3 WEINSTEIN & BERGER ¶ 702[02], p. 702–18). *See also United States v. Downing*, 753 F.2d 1224, 1242 (3d Cir. 1985) ("An additional consideration under Rule 702 – and another aspect of relevancy – is whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute"). In this case, the parties seem to agree that expert testimony as to the cause of collapse is helpful; both parties have tendered experts for that exact purpose. The court is in agreement as well. Perhaps the ultimate issue for trial in this case is causation. Expert opinions with respect to causation, including Mohajeri's, are therefore highly relevant and will assist the jury in reaching their verdict.

C. Whether the testimony is based on sufficient facts or data.

The third requirement is that the expert's opinion must be based on sufficient facts or data. *See* Fed. R. Evid. 702(b); *see also Kenosha v. Heublein*, 895 F.2d 418, 420 (7th Cir. 1990) ("experts' opinions are worthless without data and reasons"); *Elliott v. CFTC*, 202 F.3d 926, 934 (7th Cir. 2000). This is one of Lloyd's primary points of attack. Lloyd's argues that Mohajeri's testimony is not based on sufficient facts or data for two reasons: (1) because he did not account for a piece of rotted wood which was observed by Lloyd's expert, Richard Rupnow, but which Mohajeri himself

could not find in the collapsed debris; and (2) because he did not consult automated lightning strike reports of the sort Lloyd's has submitted before compiling his causation analysis. As the court will explain, in some ways those concerns go more to the reliability of Mohajeri's application of scientific principles and methods to the case, but they are still relevant here.

There are two sides to the "sufficient facts and data" issue. On one hand, an expert should take into account all of those facts which are necessary to support his findings, not just some of them, and he cannot conveniently disregard contrary evidence. On the other hand, a party cannot disqualify the other side's expert simply by disputing the facts upon which he relied. The Advisory Committee Note to Rule 702 sets out the parameters:

> Subpart [b] of Rule 702 calls for a quantitative rather than qualitative analysis. The amendment requires that expert testimony be based on sufficient underlying "facts or data." The term "data" is intended to encompass the reliable opinions of other experts. See the original Advisory Committee Note to Rule 703. The language "facts or data" is broad enough to allow an expert to rely on hypothetical facts that are supported by the evidence. *Id*.
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> When facts are in dispute, experts sometimes reach different conclusions based on competing versions of the facts. The emphasis in the amendment on "sufficient facts or data" is not intended to authorize a trial court to exclude an expert's testimony on the ground that the court believes one version of the facts and not the other.

In short, the question is whether the expert considered enough information to make the proffered opinion reliable. *See* Charles Alan Wright & Victor James Gold, FED. PRAC. & PROC. § 6266, at 41 (Supp. 2004). "[T]his inquiry examines only whether the witness obtained the amount of data that the methodology itself demands." *United States v. Crabbe*, 556 F.Supp.2d 1217, 1223 (D. Colo. 2008). To paraphrase, the question is whether a factual foundation is present upon which the expert could have based his conclusions, or whether one or more logically necessary foundational facts are absent. For the purposes of this analysis, the court temporarily assumes that the scientific principles

used by the expert are valid, asking only whether the expert considered sufficient data to support invoking those principles.[1] In this case, Mohajeri's expected expert testimony actually consists of a series of conclusions, as he eliminates possible causes of collapse with varying degrees of scientific certainty until he arrives at what he believes is the most probable cause. Each conclusion is addressed in turn.

1. Rain Water

First, Mohajeri considered whether the weight of accumulated rain water on the roof could have caused the collapse. He measured the pooling capacity of the roof based on the heigh of the lowest wall. The maximum heigh of rain water which could have accumulated before overflowing the roof was 3-4". Mohajeri then measured the weight-bearing capacity of the structure based on his measurements of the load-bearing timber members. His calculations, which have been provided to the court, showed that the weight of accumulated rain water alone could not possibly have caused the building collapse. Mohajeri himself took the measurements and observations that underlay his calculations, and those measurements and observations provided a sufficient factual foundation for the opinion he formed.

2. Rotted Timbers

Next, Mohajeri considered whether rotted timbers could have been responsible for the collapse. In studying the building, he did not find any evidence of rot, or moist areas with stain or

[1] The court is aware that some secondary sources believe the Rule 702(b) inquiry is the appropriate time to consider whether the proposed expert adequately accounted for potential alternative explanations. *See, e.g.*, FED. PRAC. & PROC. § 6266 (an expert opinion can be challenged under Rule 702(b) "because the expert failed to consider facts or data that might lead to alternative theories of causation"). But most courts consider the question of whether the expert has adequately considered alternative causes or explanations to go more to the Rule 702(d) *Daubert* inquiry concerning the reliability of the expert's application of scientific principles and methods to the case. *See, e.g., Claar v. Burlington N.R.R.*, 29 F.3d 499 (9th Cir. 1994); *Ambrosini v. Labarraque*, 101 F.3d 129 (D.C. Cir. 1996). This court prefers the latter approach.

discoloration, in any of the load-bearing timbers, although the roof decking did show signs of having been wet at one time. Mohajeri did not find any evidence of a rotted column at the collapsed location, although he could not dig into the debris pile due to safety concerns. At the time, Mohajeri was aware that an expert retained by Lloyd's had photographed a rotted beam in the debris pile [DE 68-1 at 2-3], but he could not locate it himself. He recommended that further investigation for rotted timber under the debris pile be performed. That alone would not appear to be enough to draw any conclusion. Mohajeri also observed, however, that melted tar bubbles were scattered around the first floor of the warehouse. The tar bubbles were of the same substance as the tar on the roof, although they were melted (which would require high temperature), and many had pieces of roof decking embedded in them. [DE 61-2]. The inference, based on those observations, that the tar bubbles came from the roof is an acceptable basis for opinion under Rule 702. *See* Advisory Committee Note to Fed. R. Evid. 702 ("The language 'facts or data' is broad enough to allow an expert to rely on hypothetical facts that are supported by the evidence."). A collapse due to rot and rain water would not have melted the roof tar, since it would not be a high-temperature event. That led Mohajeri to conclude that rot and rain water could not have caused the collapse.

Lloyd's complaint that Mohajeri's testimony is not based on sufficient facts because he did not consider the rot photo is meritless. For one thing, Mohajeri plainly *did* consider the rot photo. He noted it explicitly in his report. [DE 68-1 at 2-3]. But his conclusion that rot did not cause the collapse was not based on whether or not there were rotted timbers in the debris pile. Indeed, it is possible there *was* rot in the timbers, and that rot nonetheless did not cause the collapse. Mohajeri's conclusion that rot did not cause the collapse is plainly based on the melted tar/wood fragment evidence. [DE 68-1 at 4]. Evidence that a high-temperature event caused the collapse *is* a sufficient

basis for concluding that an event which did not involve high temperatures was not the cause of collapse.[2] In fact, the two are mutually exclusive. For that reason, Mohajeri's conclusion with respect to rot is based on sufficient facts and data, whether or not the rot photo played a large part in it.

3. Wind

Mohajeri then considered whether wind could have caused the collapse. He concluded it did not. There was no exterior damage to the building, and the roof had collapsed inwards, which is not indicative of wind damage. Lloyd's does not contest this aspect of Mohajeri's testimony, and it is appropriately supported.

4. Lightning

Finally, Mohajeri considered lightning. No party asserts that a lightning strike was actually observed at the site, so Mohajeri instead compared the condition of the collapse area to what he would expect to occur if lightning had indeed struck. Facts Mohajeri considered were: (1) the scatter pattern, shape, and melted consistency of the tar pieces; (2) the fact that he found a piece of the shattered metal drain pipe (which had been at the center of the collapse area) embedded in one of the melted tar pieces [DE 68-1]; (3) damage done to an interior partition wall and an interior door, which looked as though they had been "blown" open and which could not be explained by any structural warping [DE 63-1]; (4) reports that stormy weather had passed through the area around the time of the collapse [DE 68-2 at 5]; and (5) the high probability of some water pooling on the

[2] None of this is to say that Mohajeri's interpretation of the facts – in particular, that the melted tar must have come from the roof – *must* be correct. Lloyd's has an alternative theory: the tar was for some reason already present before the collapse. But that does not mean the melted tar cannot support Mohajeri's conclusion. It just means the parties are "reach[ing] different conclusions based on competing versions of the facts." *See* Advisory Committee Note to Fed. R. Evid. 702. That is not a basis for excluding Mohajeri's expert testimony any more than it is a basis for excluding Lloyd's experts' testimony. *Id*. It is a simple factual dispute.

roof, a circumstance which has been confirmed by satellite photos taken prior to the collapse. [DE 61-1]. Mohajeri then hypothesized the effect a lightning strike would have had under these circumstances by reference to a principle known as the electrohydraulic effect ("EHE"). The primary dispute between the parties concerns the scientific validity of that principle, but that is an issue to be discussed under the reliability requirements of Rule 702(c) and (d). For purposes of the "sufficient facts and data" inquiry, the question is whether, assuming for the moment that the application of the lightning/EHE principle in this context *is* valid, the facts on which Mohajeri relied provided an adequate logical foundation for concluding that it probably occurred.

The EHE, in the most general sense, simply describes what happens when a powerful electrical charge is rapidly dispersed throughout the contact surface between an object and an overlaying pool of water, generating a shock wave effect. Relevant to the circumstances of this case, one study, submitted by Jerid, used the EHE to explain the effect of a lightning strike on water pooled on a flat roof. [DE 62-2]. The study set out to explain damage done to an exhibition hall during a thunderstorm, one of three cases specifically addressed in which an unusual damage pattern occurred during stormy weather. Each roof was, like the one in this case, flat and covered with a composite material. [DE 62-2 at 6]. The author's hypothesis (simplified, of course) was that when lightning struck pooled rain water on those roofs, the charge dissipated so rapidly along the contact membrane between the water and the roof that it created a downward "blast wave" sufficient to smash through the roof. The author was able to recreate that effect on a much smaller scale in the laboratory, but was not able to explain other conditions at the damaged buildings, such as movement of objects on the interior near the collapsed portion of the roof. If the EHE principle is valid, Mohajeri did find sufficient facts here to conclude that a blast resulting from it could have occurred.

He found evidence of a high-temperature explosive event, and that seems consistent with what a lightning strike would produce, with or without the EHE. He also found interior damage, removed from the immediate site of the collapse, which appeared consistent with what would result from a "blast wave." He knew that water pooled on the roof (a fact with which all experts in this case agree) and that stormy weather had occurred near the time of the collapse. Essentially, he had sufficient data available to him to support a conclusion like the one he made.

Lloyd's argues, however, that Mohajeri's opinion that a lightning strike, coupled with the EHE, caused the collapse is not based on sufficient facts or data because he did not consult lightning strike reports to determine whether or not a lightning strike occurred. Interesting to the Court, Lloyd's does not seem to deny that lightning could, even without EHE, cause the damage necessary to produce this roof collapse. Rather, they simply contend that the best evidence here supports rotted timbers, not lightning, as the cause of the collapse. At the outset, the court notes that lightning strike reports are not always treated as entirely dispositive in the way Lloyd's seems to think they should be. *See, e.g., Pioneer Servs., Inc. v. Auto-Owners Ins. Co., Inc.*, No. 2:06-CV-377, 2007 WL 2059109 (M.D. Ala. July 12, 2007) (holding that issue of whether lightning struck was for the jury, even though insurer presented a Strikenet Report showing no lightning struck within five miles of plaintiff's business, simply because the non-expert plaintiff claimed he saw lightning within two miles and that his damaged business equipment was wet and "smelled burnt" after the storm). Moreover, the reports only show a "99% confidence ellipse" – a geometric boundary representing a 99% degree of certainty that a recorded lightning event "contacted the ground" therein. *See* Strikenet, https://stormdata.vaisala.com/ww/faq/FAQ.html (last visited Dec. 6, 2012). The site of the collapse is not within any such ellipse on the days for which Lloyd's has produced reports. But

if Mohajeri's theory is correct, the lightning strike in question never "contacted the ground" at all. It is unclear, on this record, how that might affect the ability of the Strikenet sensory network to detect its point of impact.

Moreover, 99% confidence is not a certainty. It may make the evidence weightier in a juror's mind, but it does not preclude the court, as a matter of law, from admitting differing opinions. On the criminal side, the courts have an illustrative, if glib, way of expressing the operative principle: "it is black letter law that testimony of a single eyewitness suffices for conviction even if 20 bishops testify that the eyewitness is a liar." *Hayes v. Battaglia*, 403 F.3d 935, 938 (7th Cir. 2005) (internal quotation marks omitted). Obviously, this situation is not entirely analogous, but the point about the nature of factual disputes in a court of law still stands. If Mohajeri has based his opinion that lightning indeed could have struck the building on facts and data which are logically consistent with the result a lightning strike would have produced – and he has done so – who is to say this case is not the 1%? This is an issue of weight and of factual disagreement, not an issue of Mohajeri's ability to testify as an expert at all. It is an issue that should be put to the jury.

The court does note that the issue is complicated somewhat by Mohajeri's apparent acknowledgment that he "might" change his conclusion if presented with lightning strike reports like the ones in Lloyd's possession. [DE 68-2 at 5]. But how that has any effect on whether his current opinion is based on sufficient facts or data is unclear. In any case, Mohajeri certainly *will* be confronted with the lightning strike reports at trial; there is no doubt that the defense will bring them to his attention on cross-examination, if Jerid does not beat them to it. If Mohajeri does not change his opinion at that time, so be it. His opinion will still be based on sufficient facts and data, it will just be contrary to the lightning strike reports. If Mohajeri *does* change his opinion, it will likely be

much more damaging for the plaintiff than if he had never taken the stand at all. Either way, the lightning strike reports will be made known to the jury, who are free to discredit Mohajeri's testimony if they so choose. As a result, there is no possibility of prejudice to the defendant.

In summary, Mohajeri's expert opinion is based on sufficient facts and data. Assuming that the scientific principles and methods on which he relies are valid and can be validly applied to this case, the facts of the case do logically support the conclusions he has drawn. The court now moves on to the question of scientific reliability.

D. Whether the testimony is the product of reliable principles and methods.

The fourth requirement is that the testimony must be the product of reliable principles and methods. *See* Rule 702(c). Along with Rule 702(d), this is one of the requirements directly derived from the Supreme Court's decision in *Daubert*, and it is intended to guarantee that the principles and methods which the proposed expert relies are independently scientifically reliable. "A 'principle' is a theory that can be used to explain the meaning of observations." FED. PRAC. & PROC. § 6266. "While 'principle' refers to the theories an expert employs to explain observed facts, 'method' refers to how the expert derives those theories." *Id*. In the context of this case, Mohajeri employed several "principles" in developing his opinion that lightning was the most probable cause for the collapse. Some were as simple and unassailable as the idea that the melted tar bubbles must, at some point, have been subjected to heat, since tar only melts when the temperature rises. In fact, only one scientific principle referenced by Mohajeri is under attack: the electrohydraulic effect. As to methods, the scientific method Mohajeri appears to have employed to reach his opinion is a sort of progressive, cause-elimination analysis. Lloyd's has not taken issue with it, and the evidence – including the reports by Lloyd's own experts – shows that it is a common way to perform failure

analysis within the field. Thus, the only contested issue with respect to Rule 702(c) is whether the EHE is an independently reliable scientific principle.

While *Daubert* and subsequent cases have laid out a variety of factors which often prove helpful in assessing a principle's scientific reliability, the inquiry is necessarily fact-dependent and flexible. *Lapsley v. Xtek, Inc.*, 689 F.3d 802, 810 (7th Cir. 2012). As the Supreme Court has noted, "a trial court *may* consider one or more of the more specific factors that *Daubert* mentioned when doing so will help determine that testimony's reliability. But . . . the test of reliability is 'flexible,' and *Daubert*'s list of specific factors neither necessarily nor exclusively applies to all experts or in every case." *Kumho Tire Co.*, 526 U.S. at 141 (emphasis original); *cf. Kannankeril v. Terminix Int'l, Inc.*, 128 F.3d 802, 809 (3d Cir. 1997) (holding that lack of peer review or publication was not dispositive where the principle was supported by "widely accepted scientific knowledge"); *Tyus v. Urban Search Mgmt.*, 102 F.3d 256 (7th Cir. 1996) (noting that the factors mentioned by the Court in *Daubert* do not neatly apply to expert testimony from a sociologist). The non-exclusive list of *Daubert* reliability factors for a scientific principle includes: (1) Whether a principle can be (and has been) tested; (2) Whether it has been subjected to peer review and publication; (3) Whether, in respect to a particular principle, there is a high known or potential rate of error; and (4) Whether the principle enjoys general acceptance within a relevant scientific community. *Kumho Tire Co.*, 526 U.S. at 149-50 (citing *Daubert*, 509 U.S. at 592–594).

Applying those factors to the EHE shows that – on its own, at least – it is an adequately reliable scientific principle. At its core, the concept underlying the EHE is simple. It involves "the action of very brief but powerful pulse discharges of electricity under a liquid resulting in the generation of shock waves and highly reactive chemical species." Merriam-Webster Dictionary,

http://www.merriam-webster.com/dictionary/electrohydraulic (last visited December 7, 2012) (reference to "an electrohydraulic effect" under second definition of "electrohydraulic"). The phenomenon appears to have been accepted as a basic scientific reality for decades. *See* H. K. Kutter, The Electrohydraulic Effect: Potential Application in Rock Fragmentation (United States Bureau of Mines, 1969). Extremely varied industries utilize the electrohydraulic effect by controlling the strength of the initial electrical impulse to accomplish desired results. *See, e.g.*, *Id.* (mining); "Electrohydraulic forming", http://en.wikipedia.org/wiki/Electrohydraulic_forming, (last accessed Dec. 7, 2012) (metal working); A Walters, D L Morris, A Cameron-Strange, and W Lynch, *Effect of electrohydraulic and extracorporeal shock waves on gastrointestinal cancer cells and their response to cytotoxic agents*, 33(6) Gut. 791-93 (June 1992) (treating cancer). There are countless studies and application of the EHE – whether called by that name or simply referred to as "electrohydraulics" or "electrohydraulic shock" – in the scholarly literature; far too many to list here. Not only has the principle been tested, it is actually regularly used for constructive purposes in multiple industries. Mohajeri knew about at least some of these common uses when he formed his opinion. [DE 68-2 at 8]. In short, the EHE, which is simply a description of what happens when a brief, powerful electrical charge dissipates under a liquid (it creates a shock wave), is clearly a reliable, basic principle of physical science. That says nothing, however, about whether Mohajeri has invoked and applied it to this case in a scientifically reliable way.

E. Whether the expert has reliably applied the principles and methods to the facts of the case.

The final question the court must ask is whether the expert has reliably applied sound scientific principles and methods to the facts of the case. *See* rule 702(d). This is where the court assesses the manner in which the expert has attempted to bring it all together; the question is

whether he has "bridged the analytical gap" between the mere existence of his principles in theory and his invocation of them on the specific facts of the case. *See Fuesting v. Zimmer, Inc.*, 421 F.3d 528, 536 (7th Cir. 2005) (partially vacated on unrelated grounds, 448 F.3d 936); *see also Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) ("A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered."). In addition to the non-exhaustive *Daubert* factors already mentioned, courts have found additional factors to be particularly relevant to this analysis:

(1) Whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion. *See General Elec. Co.*, 522 U.S. at 146.

(2) Whether the expert has adequately accounted for obvious alternative explanations. *See Claar*, 29 F.3d 499.

(3) Whether the expert "is being as careful as he would be in his regular professional work outside his paid litigation consulting." *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir. 1997). *See also Kumho Tire*, 526 U.S. at 152 (*Daubert* requires the trial court to assure itself that the expert "employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field").

Finally, as always in the Rule 702 analysis, the court is free to consider concerns specific to the facts of the case at hand. In this case, Lloyd's challenge goes to Mohajeri's conclusion that a lightning strike triggered an electrohydraulic shock wave under water pooled on the roof, thereby causing the collapse. Lloyd's does not clearly challenge any of the less central portions of Mohajeri's analysis.

On the current record, the court cannot find that Jerid has demonstrated the scientific reliability of Mohajeri's conclusion. The "bookends" are there; the EHE is a real, accepted phenomenon, and, if the court *assumes* that it can occur on the scale and in the context of what happened in this case, the facts are there to support that conclusion. But the court can no longer make that assumption – Rule 702(d) asks Jerid to prove it. Lloyd's experts insist that the EHE is not

a commonly accepted explanation for structural collapses, even if it is a generally reliable scientific principle, and Mohajeri himself has no idea whether it is. [DE 68-2 at 8-9]. Jerid has introduced no evidence whatsoever that the EHE ever occurs on such a large scale, or that it even would have this effect on such a large scale. The article submitted by Jerid – Jan Meppelink's "The Impact of a Lightning Stroke on a Flat Roof When the Building is Filled with Water" [DE 62-2] – is the sort of evidence the court would need to conclude that the EHE principle can be applied to this case, but it is not enough. First, the only testing the author performed was on a much smaller scale that what occurred here. [DE 62-2 at 5]. The court has been unable to locate any scientific literature testing the explosive and destructive effects of the EHE on a scale similar to this one and Jerid has provided none. Second, Jerid has given the court no information as to where this article was published, whether it is peer-reviewed, or anything else that would give the court a sense of its reliability. Third, the author could not even concretely conclude that the EHE had caused the roof collapses he was investigating. That is hardly scientifically conclusive. Finally, the court notes that Mohajeri's own report does not do a thorough job of explaining how he applied the EHE principle to this case. [DE 68-1 at 4]. He simply mentions how the EHE works, and concludes it happened here.

Moreover, Mohajeri does not seem to have adequately accounted for alternative explanations. Even restricting the court's consideration to lightning-related scenarios, Mohajeri has not explained why the evidence does not also support the conclusion that lightning hit a dry roof, or that lightning struck a wet roof, but on which no water was pooled. Either scenario might still explain the damage, but without resort to invoking the EHE.

None of this is to say the EHE principle *cannot* be applied in this case reliably. It is only to say that at this point, Jerid has not carried its burden of "bridging the analytical gap" between the

principle and the facts of the case. *Gen. Elec. Co.*, 522 U.S. at 146. As things stand, Mohajeri would be permitted to testify as an expert with respect to most of his conclusions, including his elimination of rot as a possible cause. He would not, however, be able to testify as to his conclusion that a lightning strike into pooled water on the roof triggered the EHE and caused an explosive event. The court will give Jerid another chance to carry its burden, however. The Court proposes that, to the extent Jerid wants to pursue Mohajeri's testimony about EHE, they produce him immediately after jury selection and outside the presence of the jury so that the parties and the Court can ascertain the foundations for his conclusions. If he is then able to draw the necessary links, he will be permitted to testify in full. If not, his testimony will be limited as indicated herein.

CONCLUSION

For the reasons stated herein, Lloyd's motion to bar expert testimony by Peter Gaitan [DE 45] is **GRANTED**. Gaitan may testify as a fact witness, and he may also testify as to his lay opinion based on basic observables, but he may not offer any conclusive opinions about whether and how lightning could have caused the collapse. That would amount to Rule 702 testimony by a witness not qualified as an expert. Lloyd's motion to bar expert testimony by Jerry Mohajeri [DE 44] is partially, and conditionally, **GRANTED**. It is "partially" granted because the court sees no problem with Mohajeri's qualifications as an expert, or with his use of the facts, reliance on scientific principles, and application of those principles to the case, *except* with respect to his final conclusion that the collapse was caused by a lightning strike into pooled water triggering the electrohydraulic effect and thereby causing the collapse. He may testify as to all of his conclusions up to that point. It is "conditionally" granted because the court's conclusion that, as of now, Mohajeri has not bridged the analytical gap does not mean Mohajeri *cannot possibly* bridge the analytical gap. If Jerid so

chooses, it may put the witness on outside the presence of the jury at the earliest opportunity during trial and attempt to lay a better foundation for his conclusions.

SO ORDERED.

ENTERED: December 10, 2012

/s/ JON E. DEGUILIO
Judge
United States District Court