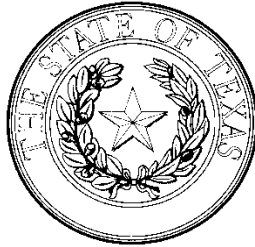


Dissenting opinion issued August 16, 2012



**In The
Court of Appeals
For The
First District of Texas**

NO. 01-10-00719-CV

**CONTROL SOLUTIONS, INC., UNITED PHOSPHORUS, INC., AND
MARK BOYD, Appellants**

V.

GHARDA USA, INC. AND GHARDA CHEMICALS, LTD., Appellees

**On Appeal from the 55th District Court
Harris County, Texas
Trial Court Case No. 2004-67993**

DISSENTING OPINION

I respectfully dissent. CSI's case depended heavily on a series of interdependent expert opinions, none of which was sufficient on its own to support a conclusion that the cause of the fire was a spontaneous ignition of fumes

occurring due to EDC contamination in chemical products marketed and sold by the Gharda entities. More importantly, even taken together, the expert opinions did not rest upon a reliable basis sufficient to justify their admission into evidence. The district court correctly concluded that these opinions could not support the jury's verdict. Even if the remaining factual circumstantial evidence were sufficient to support a conclusion that the fire was started by some defect in the Gharda product, there was no evidence to demonstrate what that defect was, how it came about, or who was responsible for it. Accordingly, I would affirm the district court, which correctly rendered a take-nothing judgment.

I. Supplemental background

The majority opinion advocates for the admissibility of the challenged expert opinions without adequately acknowledging and addressing the arguments about their deficiencies. To put the issues presented in their proper context, the following summary provides additional detail about the key expert opinions at issue and the criticisms interposed by the Gharda entities.

A. Sammy Russo, fire investigator

CSI describes Sammy Russo as its "fire origin expert." His background and qualifications as a fire investigator are not at issue in this appeal, but the reliability of his methodology and resulting opinions are. After CSI's trial counsel had already preliminarily determined and informed Gharda that "container drums of

Chlorpyrifos Technical, manufactured and/or distributed by Gharda USA . . . were located in the probable location of the fire’s origin and may have been the cause of the fire,” the same lawyers hired Russo, who subsequently made his first visit to the CSI facility six days after the fire without actually entering the facility at that time. He first physically entered the facility during his second visit, nine days after the fire. During that inspection, Russo wore a full-body protective suit to avoid exposure to chemicals on the premises.

Russo claimed to use a methodology known as NFPA 921 to perform his investigation.¹ Despite being referenced repeatedly at trial and in the parties’ briefing, a copy of NFPA 921 does not appear to have been made part of the appellate record. It was fundamentally CSI’s burden to demonstrate that its proffered expert opinion testimony rested upon a reliable basis. *See E.I. du Pont de Nemours & Co. v. Robinson*, 923 S.W.2d 549, 556 (Tex. 1995).² Based on

¹ In a general sense, NFPA 921 has been accepted by many courts as a scientifically reliable methodology for investigating the cause and origin of a fire. *See, e.g., Proffitt v. State*, No. 01-02-00692-CR, 2003 WL 22512074 (Tex. App.—Houston [1st Dist.] Nov. 6, 2003, pet. ref’d) (mem. op.). *See generally* 5 DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 39.9 (2011–2012 ed.); REPORT OF THE TEXAS FORENSIC SCIENCE COMMISSION: WILLINGHAM/WILLIS INVESTIGATION, at 14 (2011) (hereinafter, WILLINGHAM REPORT), *available at* <http://www.fsc.state.tx.us/documents/FINAL.pdf> (recognizing NFPA 921 as expressing the “contemporary standard of practice”).

² It is also CSI’s burden as appellant to bring us a complete record supporting its request that we reverse the judgment of the trial court based upon our de

various observations, Russo developed a hypothesis that the fire started in the southwest quadrant of the building, where the hot box was located.³ The factors that he said led to his hypothesis included the general location of the fire's origin as indicated by helicopter news video footage, reports from firefighters who

novo review of the trial court's rendition of a JNOV. The relevant text of NFPA 921 was made available to the trial court, but it has not been provided to us, which makes it difficult to conclude, as the majority has, that Russo complied with NFPA 921 in its material particulars so as to provide a reliable basis for his opinions. CSI relies on Russo's assertion that he followed NFPA 921 as support for the supposed reliability of his method, but, as acknowledged by the panel majority, the Gharda entities disputed whether Russo's method actually adhered to the guidelines of NFPA 921. The majority nevertheless accepts and relies upon Russo's assertions that he actually followed NFPA 921's procedures, despite the fact that the record contains no basis upon which the majority could make that determination de novo. In particular, the majority entirely fails to address one of the criticisms of Russo's supposed adherence to NFPA 921: the requirement that a hypothesis about the location of a fire's origin be confirmed by identification of an ignition source before an opinion can be reliably formed about cause and origin.

³ In its appellate brief, CSI characterized Russo's opinion at trial more broadly, stating that his opinion was that "the physical evidence was consistent with a low-order explosion within the hot box from an ignitable vapor, and fire originating from the hot box in the southwest quadrant of the building." The record citations provided in support of this characterization confirm only that Russo claimed to follow the guidelines of NFPA 921, that he opined that "[e]verything that [he] looked at [was] consistent with it being a very low order pressurization of the box . . . that's consistent with the damage that's here," and that there was a "fire that emanated from the hot box and went to other areas of the building." At the pretrial *Robinson* hearing, Russo affirmatively disclaimed offering an opinion about the cause of the fire—he confined his proposed opinion only to the location of its origin. He specifically stated, "I don't think I was tendered to render a cause. I was tendered to render an origin."

entered the northwest quadrant and reported fire to their right, fire patterns leading away from the hot box and the absence of fire patterns leading toward the hot box, damage to the hot box including doors and hinges which appeared to have been “blown open” or “pushed open,”⁴ a “V” burn pattern on the wall behind the hot box, and the appearance that three drums inside the hot box looked different than the others and showed signs of very hot burning.

As described by Russo, the NFPA 921 investigation procedure contemplates the development of a preliminary hypothesis that must then be evaluated to “ensure it has scientific merit.” Russo specifically agreed that in order to test his hypothesis, he would need “some testing that would show under the circumstances involved, whatever was in this barrel would be something that could be a source of an ignitable vapor.” After the hypothesis had been tested, then an opinion of fire origin and cause could be developed.⁵

⁴ Russo testified at trial: “Once I saw the hot box, I saw that the hinges had been – and I’m going to use the term ‘blown open,’ but they’re pushed open. Okay? That’s a more accurate description.”

⁵ Relevant portions of NFPA 921 quoted during the *Robinson* hearing confirm these aspects of the protocol. The quoted portions of NFPA 921 provide that the determination of the cause of a fire “requires the identification of those circumstances and factors that were necessary for the fire to have occurred,” including but not limited to the “presence of a competent ignition source, the type and form of the material first ignited and the circumstances or human actions that allowed the factors to come together.”

Russo did not affirmatively testify that any scientific analysis performed by him led to or confirmed a conclusion that a “low-order explosion within the hot box from ignitable vapor” either happened or was even physically possible. Instead, to confirm those conclusions, Russo suggested that additional experts be engaged. He specifically recommended that an electrical engineer be engaged to inspect electrical components removed from the hot box for mechanical or electrical malfunction.⁶ The electrical engineer retained by CSI’s trial counsel for this purpose concluded that whatever might have ignited a fire in the hot box, it was not an electrical or mechanical source. Therefore, still another opinion was required to explain how the fire could have started inside the hot box.

B. Dr. Andy Armstrong, chemist

Another one of the supplemental experts suggested by Russo was chemist Dr. Andy Armstrong. Russo’s objective in recruiting Dr. Armstrong was described by CSI as being “to determine a testing protocol because there was no product left in the drums to test post-fire.”⁷ The “protocol” developed by the experts hired by

⁶ The engineer presented as CSI’s witness to inspect for mechanical or electrical malfunction was Roger Owen. Owen testified that “[i]t was pretty obvious that you had a fire in the oven,” and his task was to determine whether the cause was “electrical or mechanical or something else.”

⁷ Although CSI’s testing protocol was premised on the assertion that the experts had no other means to test the Gharda product, there were samples from several other sources that they chose not to investigate. There were burned remains found in some of the Gharda drums after the fire, but CSI’s

CSI's counsel involved taking the empty Gharda drums and placing them—13 days after the fire—into “overpacks” containing a charcoal badge⁸ designed to capture materials present in the air.⁹ In his deposition, Dr. Armstrong admitted that the vapors collected by the badge test could have come from a number of sources, including the decomposition of the Gharda product (the chlorpyrifos technical), byproducts of the fire, and the surrounding air in the area of the Houston Ship Channel. At trial, Russo described the testing as follows:

experts chose not to test those samples. The CSI experts also chose not to test for EDC contamination two unburned chlorpyrifos drums that came from the same shipment as those destroyed in the hot box. The Gharda entities tested the contents of those drums and found their EDC levels to be within product specifications. There were also retained Gharda samples from the same batch of chlorpyrifos, but CSI's experts chose not to test those, either. The Gharda entities' tests on those retained samples showed that none of the chlorpyrifos retains had excess EDC.

⁸ Dr. Armstrong explained that these “3M industrial hygiene exposure badges” were “basically a charcoal substrate that has a personnel monitor,” derived “from the world of industrial hygiene where you would take it out of the container, pin it on your label and wear it all day to see what you're exposed to.”

⁹ Both CSI and the majority suggest that the Gharda entities agreed to, cooperated with, or at least acquiesced in the testing “protocol” developed by Russo and Dr. Armstrong. There is no evidence that investigators at the site on behalf of the Gharda entities were anything more than passively aware of the tests performed on behalf of CSI. More importantly, the alleged agreement or acquiescence of other investigators does not substitute for a demonstration by CSI that its testing methodology was reliable.

. . . When you have a coat type of material, it tends to absorb chemicals. So what we did was take each drum out individually out of the hot box.

We developed a numbering system from left to right, TF-1 being top front 1. It's not a – you know, we used the most complicated thing for us arson investigators.

And we took one drum at a time and we placed it into an overpack, which is a larger drum that will seal. We put the full contents of it, the bits and pieces of the drum, placed it in there. And on top of each drum, we had a charcoal canister. Charcoal absorbs hydrocarbons. It absorbs vapors.

These are sealed containers.

...

. . . [The charcoal canister has] got a layer of charcoal. It's got badge type of device in there. . . . [I]t comes sealed. So there's no – no contamination.

What we did was place a drum in the overpack, pull the seal. We did one sample at a time so we didn't run the risk of mixing up, you know, drums or containers. Labeled each one individually, popped the seal and put the – put the lid on the overpack and allowed this to sit until we removed the samples from the overpack.

...

. . . [The] charcoal badge . . . functions by passive absorption. When it's exposed to vapors – chemically, vapors move from a higher concentration to, in this instance, no concentration or a lower concentration and it saturates the badge.

This is then subsequently removed and there is a little seal that you place over this and this is sent to a testing laboratory where they analyze the contents.

We didn't open these until we put them in the drum because we didn't want to sample the air space within the – within the building. So we were very careful to do that – this is the last step before we put the seal on the drum.

The virgin unburned Gharda product that was contained in the drums before the fire had decomposed or degraded before the vapor samples were collected. Thus, the badge testing was performed on vapors “found or absorbed into each badge” during the time the badges were exposed inside the overpacks. Russo agreed that the testing only showed relative amounts of the substances detected in the vapors, and it was not quantitative in the sense that the testing did not quantify how much of each detected substance was present before the fire. Nevertheless, Dr. Armstrong endorsed this testing process as being “extremely standard” and “the most convenient, simplest way to identify the volatiles that are associated with the fire debris.” It was by this method that the CSI experts tested the charcoal badges in an attempt to document the contents of the drums.

Dr. Armstrong tested the charcoal badges, describing the work he did as analyzing “fire debris.” The results from this process, which started nearly two weeks after the fire, detected the presence of numerous “volatile components” in some of the overpacks used in the testing.¹⁰ One of the substances detected by the

¹⁰ Dr. Armstrong testified that his “evaluation established that there were volatile components present in the hotbox after the fire,” and that “[t]hese volatile components included, but [were] not limited to, toluene, EDC, aromatic compounds, other structures other than toluene, such as . . .

testing was toluene, a flammable substance. Dr. Armstrong initially developed an opinion—which CSI disclosed in discovery—that the fire was caused by chlorpyrifos technical that was contaminated with toluene. However, subsequent to the disclosure of this opinion, fact discovery in the case revealed that toluene was not used in Gharda’s manufacturing processes. Dr. Armstrong testified in his deposition that his realization that toluene “was not used in the production” and thus “would not be present due to an impurity . . . in the chlorpyrifos” led to “further evaluation” and his “change of position.”

With toluene contamination ruled out as a cause of the fire, Dr. Armstrong selected a different substance detected by some but not all of the badge tests: a solvent used to manufacture chlorpyrifos known as EDC. The badges used to test specific drums identified as the source of the fire did not show any evidence of EDC, but Dr. Armstrong explained that result by saying that severe burning of those drums caused all of the EDC to evaporate. When Dr. Armstrong first identified EDC as the substance that caught fire, he had no theory about how it ignited. He later supplemented his opinion with his explanation that the chemicals spontaneously combusted. He explained, “[I]t is my opinion, based on my scientific training and experience and the literature that’s available to me,

ethylbenzene and xylenes and few other things were found in the system, mainly a lot of pyrolysis products from the various barrels.”

especially the Gharda literature, that the system underwent a series of reactions after it was melted that ultimately caused a runaway reaction.”

Importantly, Dr. Armstrong did not conduct any tests to confirm the reliability of the badge-test protocol, nor did he conduct any tests to confirm that EDC-contaminated chlorpyrifos could spontaneously combust under the conditions present in the hot box. He did not determine how much EDC had to be present to produce a spontaneous combustion or otherwise test to confirm the actual presence of a sufficient amount of EDC contamination to start the fire. He did not review any studies about whether chlorpyrifos could self-combust, including no review of any studies about the effect of EDC contamination on chlorpyrifos. Instead, Dr. Armstrong expressly assumed the fire began in the hot box and then effectively relied on the process of elimination to deduce the cause, as illustrated during his cross-examination at the *Robinson* hearing:

Q [N]o one was able to identify any source of the ignition within the hotbox, were they?

A That is correct, to my knowledge, no one can specifically identify a component of the hotbox that would cause ignition.

Q And so since no one knows of any component to cause ignition to the hotbox, you came to the conclusion it had to be spontaneous because there's no source of ignition, right?

A Well, one of the premises of investigation is if you eliminate all other sources, it has to be the one that's left, so yes.

....

Q [R]eally what you did was reverse engineer because you took the idea it had to be in the hotbox because that's what these fire and origin guys say; and so if the only thing is in there, then it has to be the chlorpyrifos, right?

A That's – except for the reverse engineering, that's very logical.

Q And then if there's no source of ignition in there, then, well, it's just got to just self-ignite, right?

A Yes, sir, that is – the logic follows very nicely. I like your logic.

Q And you don't have to – then you did not perform any test to figure out whether or not there was, in fact, enough EDC in there or even how much EDC it would have to have in it in order for this spontaneous combustion to have or even perform any test in order to support the position that you're taking. You just didn't do any of that testing, did you, sir?

A Personally I did not test this product under those conditions. I relied upon the analytical data, the published literature from other sources to provide that information.

Indeed, Dr. Armstrong dismissed the notion that testing played any meaningful function in his role as a retained expert witness for the case. He testified that “running a couple of experiments just to say, ‘I ran an experiment,’ I don't believe is necessary, fruitful or beneficial. Science must rely on independent evaluation of the phenomenon that we are discussing. And it's simply very, very straightforward.”

Although Dr. Armstrong produced the badge tests as his evidence that EDC was detected in the air trapped inside the “overpacks,” and he relied upon those tests to deduce that the fire was caused by excess EDC present in the chlorpyrifos drums, the foregoing analysis did not enable him to offer his own expert opinion that an amount of EDC sufficient to cause a spontaneous combustion was actually present in the Gharda product. In an attempt to fill that analytical gap, CSI turned to another expert witness, Dr. Nick Cheremisinoff.

C. Dr. Nick Cheremisinoff, chemical engineer

CSI retained Dr. Cheremisinoff to review Gharda’s manufacturing process and to provide expert testimony in support of the theory, which could not be confirmed by the badge testing, that the drums of chlorpyrifos were contaminated by excessive amounts of EDC. Based on his judgment that Gharda’s manufacturing process was very complex and labor intensive, he concluded that it was “within the realm of probability” and “possible” that such EDC contamination had occurred.

Dr. Cheremisinoff expressly assumed that the fire was caused by the chlorpyrifos, and he admitted that he did not know how it was ignited. He conducted no tests to support his opinion, and he relied upon no peer-reviewed studies to support his criticisms of the Gharda manufacturing process. He did not base his opinion on any evidence of actual EDC contamination. He reviewed

Gharda's written manufacturing protocols, but he never personally observed Gharda's plant or any of its manufacturing procedures.

II. Analysis

Although the panel majority refers to the district court's discretion with respect to evidentiary matters, this is an appeal from the trial court's order granting JNOV, which we review de novo under a no-evidence standard. *See City of Keller v. Wilson*, 168 S.W.3d 802, 823 (Tex. 2005); *Johnson v. Methodist Hosp.*, 226 S.W.3d 525, 528 (Tex. App.—Houston [1st Dist.] 2006, no pet.). On appeal we apply the same standards of legal and factual sufficiency that would apply to any civil dispute and which presumably informed the district court's consideration of the motion for JNOV.¹¹

¹¹ The Gharda entities suggest that the trial court's ruling should be reviewed for abuse of discretion, relying on *Raynor v. Merrell Pharms., Inc.*, 104 F.3d 1371, 1373–74 (D.C. Cir. 1997), and *Comer v. Am. Elec. Power*, 63 F. Supp. 2d 927, 930–31 (N.D. Ind. 1999). The reasoning applied in these cases, governed by federal rules of procedure, does not support abuse-of-discretion review under the Texas rules. The trial court exercised its discretion in connection with evidentiary rulings when it conducted the pretrial gatekeeping hearing and when it ultimately admitted the opinions of plaintiffs' experts into evidence. By the time the Gharda entities filed their motion for JNOV, the trial court's discretion had been exercised, the jury had rendered a verdict, and the question before the trial court was whether the jury's findings had any support in the evidence. *See TEX. R. CIV. P. 301; cf. Whirlpool Corp. v. Camacho*, 298 S.W.3d 631, 638 (Tex. 2009) (“[A] party may assert on appeal that unreliable scientific evidence or expert testimony is not only inadmissible, but also that its unreliability makes it legally insufficient to support a verdict.”). The motion for JNOV was not, as suggested by the Gharda entities' argument, an opportunity for the trial court

“An expert witness may testify regarding scientific, technical, or other specialized matters if the expert is qualified, the expert’s opinion is relevant, the opinion is reliable, and the opinion is based on a reliable foundation.” *Whirlpool Corp. v. Camacho*, 298 S.W.3d 631, 637 (Tex. 2009) (citing, inter alia, TEX. R. EVID. 702). “Conclusory or speculative opinion testimony is not relevant evidence because it does not tend to make the existence of material facts more probable or less probable.” *Id.* (citing TEX. R. EVID. 401 and *Coastal Transp. Co. v. Crown Cent. Petroleum Corp.*, 136 S.W.3d 227, 232 (Tex. 2004)). We are required to “rigorously examine the validity of facts and assumptions” on which expert testimony is based, “as well as the principles, research, and methodology underlying the expert’s conclusions and the manner in which the principles and methodologies are applied by the expert to reach the conclusions.” *Id.* (citing *Exxon Pipeline Co. v. Zwahr*, 88 S.W.3d 623, 629 (Tex. 2002)). “[E]ach material part of an expert’s theory must be reliable.” *Id.*

A. Deficiencies of individual experts

The majority opinion uncritically describes the testimony offered by each of CSI’s putative experts, reciting each expert’s assertions, and concluding that each expert offered admissible opinion testimony. This flawed approach completely

to revisit and revise the discretionary trial rulings that it had previously rendered.

abandons the court’s “gatekeeper” function with respect to expert testimony by dodging the Gharda entities’ criticisms of each expert and failing to critically analyze the substance of what each expert presented to the jury. And while the objections to each expert were legion, a central theme was that each expert depended on some critical element that had to be supplied by another expert.

i. Russo

Sammy Russo was presented to establish that the fire originated in the hot box.¹² Although his testimony explained his hypothesis that the fire began with an

¹² The majority opinion suggests that Russo was an unbiased scientific investigator whose work was not tainted by the incentives to support CSI’s litigation objectives, emphasizing that “Russo testified that his own involvement in this case began as a fire-origin investigator in the immediate aftermath of the fire and that he formed his opinions regarding the fire’s origins in that capacity.” The majority then quotes Judge Kozinski’s opinion on remand in *Daubert* and the opinion of the Supreme Court of Texas in *Robinson* for the proposition that “when an expert prepares reports and findings before being hired as a witness, that record will limit the degree to which he can tailor his testimony to serve a party’s interests.” *Robinson*, 923 S.W.2d at 559 (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995)). In fact, as noted in the majority opinion and admitted by Russo on direct examination, his involvement in the matter began when his office received a call from the firm of the trial lawyers hired by CSI. Accordingly, the majority misuses *Daubert* and *Robinson* to varnish the fact that Russo was hired by CSI’s trial counsel and developed his opinions for use in litigation. Given this fact, there is no reason to characterize his method as “non-judicial” or to conclude that his analysis may be reliable on such a basis. The reliability of the NFPA 921 methodology, which Russo putatively applied, is not disputed in this case. The dispute is about whether Russo actually and faithfully applied the methodology.

explosion in the hot box, he did not provide his own opinion testimony about whether or how such an explosion actually came about. He needed to rely on some other expert to supply that explanation.

As a threshold matter, Russo's opinions are unreliable due to his failure to follow NFPA 921, and his opinion testimony was properly disregarded for that reason alone. The significance of "V" patterns relied upon by Russo to determine the place of origin has been criticized as a "discredited" theory in this context.¹³ Moreover, Russo relied heavily on the characterization of the doors to the hot box as having been "pushed open" or "blown open," yet he provided no explanation meeting the *Robinson* standard for how such a rupture could have occurred despite the fact that after the fire the bunghole caps for the Gharda drums were found resting undisturbed on the tops of the drums where CSI personnel had left them.¹⁴

¹³ See 5 FAIGMAN ET AL., *supra* note 1, § 39:13, at 197; see also WILLINGHAM REPORT, *supra* note 1, at 23 ("In the early 1990's, many fire investigators based their conclusions of origin in part on the theory that a 'V-pattern' on a wall points to the origin of the fire. . . . Scientists now know that the 'V-pattern' simply points to where something was burning at some stage of the fire, not necessarily the origin.").

¹⁴ The majority opinion quotes Russo's testimony regarding the fact that the bunghole caps for the Gharda drums were found after the fire, resting on top of the drums inside the hot box. But the majority never addresses the significance of that evidence or Gharda's argument that it tends to disprove Russo's hypothesis of an explosion inside the box of such magnitude that it "blew" open the doors. The majority opinion recites Russo's attempt to explain the presence of the undisturbed bung caps when he said, "You don't have differential pressure to blow those bungs out or give direction to this—

We cannot ignore such “fatal gaps in an expert’s analysis or assertions,” nor “credit as some evidence expert opinions that are not reliable or are conclusory on their face.” *Volkswagen of Am., Inc. v. Ramirez*, 159 S.W.3d 897, 912 (Tex. 2004).

Russo’s most glaring departure from the NFPA 921 methodology, and the one that most seriously undermines the reliability of his opinion testimony, was his failure to subject his hypothesis to meaningful testing. The hypothesis about the place of the fire’s origin could not become a reliable opinion about the cause and origin of the fire without a credible explanation of how the fire could have started there.¹⁵ Russo admitted as much when he testified that if the drums inside the hot

this type of event.” Yet the majority opinion does not critically consider this explanation, which, based on the record presented to us, has no apparent scientific basis at all. There is no basis in the record for confirming the reliability of the statement; we only have the fact that Russo said it.

¹⁵ It is unclear from the appellate record whether NFPA 921 would strictly require the confirmation of a potential ignition source before a reliable opinion can be formed about the physical origin of the fire. However, Russo expressly agreed that in order to “really test” his hypothesis, he would “have to have some testing that would show that under the circumstances involved, whatever was in this barrel would be something that could be a source of an ignitable vapor.” Other authorities also confirm the Gharda entities’ characterization of the standard as incorporating a testing requirement. *See, e.g., Fireman’s Fund Ins. Co. v. Canon U.S.A., Inc.*, 394 F.3d 1054, 1058 (8th Cir. 2005) (“NFPA 921 requires that hypotheses of fire origin must be carefully examined against empirical data obtained from fire scene analysis and appropriate testing.”); *Royal Ins. Co. of Am. v. Joseph Daniel Const., Inc.*, 208 F. Supp. 2d 423, 426 (S.D.N.Y. 2002) (“The NFPA 921 sets forth professional standards for fire and explosion investigations and provides a six step process in which an investigator must: (1) recognize that a need exists to determine what caused the fire; (2) define the problem; (3) collect

box had been filled with water or another liquid that was not ignitable, he could not have formed an opinion that such a liquid was the source of the fire in the hot box. The record contains no evidence that Russo (or any other CSI expert) was aware of any test showing whether or under what conditions chlorpyrifos contaminated with EDC could spontaneously combust. Nor did he (or any other CSI expert) personally test the theory. Nevertheless, he offered his opinion that the fire started in the hot box, relying solely upon the other experts who opined that this scenario could and did happen. Russo's opinion, standing alone, was unreliable in the absence of supporting scientific testing. *See, e.g., Whirlpool*, 298 S.W.3d at 640–42; *see also Zeigler v. Fisher-Price, Inc.*, No. C01-3089-PAZ, 2003 WL 25686840, at *10 (N.D. Iowa July 1, 2003) (holding that in the absence of scientific testing, a proposed cause-and-origin analysis based on an expert's "common-sense deductions" merely constituted "unsupported personal observations" and thus could not be admitted into evidence); REPORT OF THE TEXAS FORENSIC SCIENCE COMMISSION: WILLINGHAM/WILLIS INVESTIGATION, at 30 (2011), *available at* <http://www.fsc.state.tx.us/documents/FINAL.pdf> ("Fire

data; (4) analyze the data; (5) develop a hypothesis based on the data; and (6) test the hypothesis." (citing TECHNICAL COMMITTEE ON FIRE INVESTIGATIONS, NATIONAL FIRE PROTECTION ASSOCIATION, NFPA 921: GUIDE FOR FIRE AND EXPLOSION INVESTIGATIONS, at 9–10 (1998 ed.)).

investigators should have a thorough understanding of the importance of laboratory testing as a tool for confirming the theory of a case”).

As explained below, the analytical gap in Russo’s methodology was not filled by the opinions of any of the other experts. To the extent that Russo purported to provide an overarching opinion about cause and origin, that opinion was only as reliable as the subsumed opinions about the cause of the fire. To the extent that Russo’s opinion was limited, as he himself stated, solely to the location of the fire’s origin, even that aspect of his opinion was unreliable due to methodological failures, particularly the failure to actually test the hypothesis or otherwise reliably confirm that a spontaneous combustion was possible under the circumstances. *See, e.g., Fireman’s Fund Ins. Co. v. Canon U.S.A., Inc.*, 394 F.3d 1054, 1058–59 (8th Cir. 2005) (concluding that proposed experts did not conform to methods of NFPA 921 when experimental testing failed to produce an open flame and the hypothesized malfunction could not be adequately explained in theory or replicated in a test).

ii. *Dr. Armstrong*

Dr. Armstrong was presented to supply an explanation for how the fire could have spontaneously ignited as a result of rapid chlorpyrifos decomposition due to EDC contamination in the Gharda product. His analysis expressly assumed a critical disputed fact: that the fire started in the hot box. Thus, his analysis did not

account for the possibility that there was no explanation for the fire's origin within the hot box because the fire actually started someplace else. "An expert who is trying to find a cause of something should carefully consider alternative causes," and the failure to rule out other causes of the damage renders an opinion "little more than speculation." *Robinson*, 923 S.W.2d at 559.

Even assuming that the fire started in the hot box, Dr. Armstrong's method for identifying EDC-contaminated chlorpyrifos as the culprit was unreliable. In the absence of physical evidence that the fire was caused by EDC contamination, Dr. Armstrong freely admitted that he relied upon the process of elimination to draw that conclusion. However, such reasoning cannot substitute for scientific analysis, particularly when a critical disputed fact has been assumed—in this case, the place of the fire's origin—as an analytical shortcut to avoid the rigors of actual scientific analysis. *Cf. Cooper Tire & Rubber Co. v. Mendez*, 204 S.W.3d 797, 807–08 (Tex. 2006) ("The universe of possible causes for the tire failure is simply too large and too uncertain to allow an expert to prove a manufacturing defect merely by the process of elimination."). Such uses of the process of elimination have been scathingly criticized in the context of developing a reliable opinion about the cause of a fire:

The process of determining the ignition source for a fire, by eliminating all ignition sources found, known, or believed to have been present in the area of origin, and then claiming such methodology is proof of an ignition source for which there is no

evidence of its existence, is referred to by some investigators as “negative corpus.” Negative corpus has typically been used in classifying fires as incendiary, although the process has also been used to characterize fires classified as accidental. This process is not consistent with the Scientific Method, is inappropriate, and should not be used because it generates untestable hypotheses, and may result in incorrect determinations of the ignition source and first fuel ignited. Any hypothesis formulated for the causal factors (e.g., first fuel, ignition source, and ignition sequence), must be based on facts. Those facts are derived from evidence, observations, calculations, experiments, and the laws of science. Speculative information cannot be included in the analysis.

5 DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 39:65, at 291 (2011–2012 ed.) (quoting TECHNICAL COMMITTEE ON FIRE INVESTIGATIONS, NATIONAL FIRE PROTECTION ASSOCIATION, NFPA 921: GUIDE FOR FIRE AND EXPLOSION INVESTIGATIONS § 18.6.5 (2011 ed.)); see also *Somnis v. Country Mut. Ins. Co.*, 840 F. Supp. 2d 1166, 1172–73 (D. Minn. 2012) (allowing fire investigator to testify about the absence of accidental causes, but excluding opinion testimony that “the absence of an accidental explanation suggests the fire was incendiary”).

There was no physical evidence of EDC contamination in the drums identified by Russo as the origin of the fire. Dr. Armstrong relied instead on evidence of EDC present in other drums, and he therefore speculated that EDC had also been present in the drums where Russo hypothesized that the fire was started. Dr. Armstrong explained away the absence of evidence of EDC in those drums by

further speculating that it was entirely consumed in the fire. To the extent this reasoning can be characterized as the discredited “negative corpus” methodology, it does not support a reliable opinion that the fire was caused by spontaneous combustion of chlorpyrifos contaminated with EDC.

Even to the extent that Dr. Armstrong relied upon evidence of EDC in other drums to support an inference that EDC had been present at the source but entirely consumed in the fire, that evidence itself resulted from an unreliable, untested, non-peer-reviewed process of collecting airborne chemicals from charcoal patches to identify the presence of contaminants.¹⁶ No tests were conducted to determine whether the presence of excessive levels of EDC existing before the fire could be reliably detected after the fire by the badge-testing method. And no tests were

¹⁶ The majority opinion relies upon Dr. Armstrong’s conclusory assertion that the badge-testing protocol was a “tried and true” “standard test” to identify the presence of EDC in the drums prior to the fire. As characterized by the majority, the test was conducted “in accordance with ‘ASTM E1618,’ which provides the standard test method for ignitable liquid residues in extracts from fire debris samples by gas chromatography-mass spectrometry, like the 3M badges.” However, nothing in the record suggests that the CSI experts’ particular application of the charcoal badges in this case, placing them inside “overpacks” with the chemical drums nearly two weeks after the fire, is a method authorized or approved by ASTM E1618. Indeed, as demonstrated by the record of the *Robinson* hearing, ASTM standards were invoked only with respect to the “passive absorption elution technology” used in the charcoal badges and the “gas chromatograph mass spectrometry evaluation of the sample.” No peer-reviewed non-judicial ASTM standard was invoked as an authority for Russo and Armstrong’s so-called badge-testing “protocol” for the identification of contaminants that may have been present before the fire.

conducted to verify whether a drum of chlorpyrifos contaminated with a sufficient level of EDC to create a spontaneous combustion could be burned so thoroughly as to eliminate all evidence of the EDC. In particular, neither Dr. Armstrong nor any other expert was able to explain how there could have been sufficient amounts of EDC contamination to cause spontaneous combustion of the chlorpyrifos, considering Gharda's tests that showed chlorpyrifos would not burn with EDC levels up to 10%, at which level the top 60% of the drum would have been liquid. The undisputed evidence from CSI's own employees was that the contents of the drums of chlorpyrifos at issue were solid at the time they were placed in the hot box. The failure to account for this fact renders Dr. Armstrong's methodology and opinion unreliable. *See Volkswagen*, 159 S.W.3d at 912.

Additionally, the ambient air was not subjected to a badge-test to establish a control against which the other badges could be compared. CSI's warehouse was located in the industrial area located around the Houston Ship Channel. The warehouse had stored a variety of chemicals before the fire. The toxic atmosphere present in the fire's aftermath was vividly illustrated by the full-body protective suit worn by Russo as a precautionary measure. To the extent the charcoal badges placed into "overpacks" with the Gharda drums detected trace amounts of EDC weeks after the fire, the badge-testing methodology did not even purport to distinguish EDC that might have been present in the drums of chlorpyrifos before

the fire from what EDC might have been present in the ambient air. Indeed, Dr. Armstrong himself relied on the existence of extraneous chemicals in the ambient air to explain the badge tests' detection of toluene that was proved not to be part of Gharda's manufacturing process. The badge-testing process was therefore self-evidently unreliable due to its lack of testing, *see Whirlpool*, 298 S.W.3d at 640–42, and its failure to reliably account for the alternative possibility that the badges were detecting extraneous chemicals present in the ambient air, *see Volkswagen*, 159 S.W.3d at 912.

Finally, we should not ignore the evolution of Dr. Armstrong's opinions, which betrays the methodological flaw of beginning from a preordained conclusion to fit a litigation strategy, and then constructing explanations to support the conclusion. Based upon the charcoal patches' indication that toluene was present, Dr. Armstrong originally offered an opinion that the spontaneous ignition of chlorpyrifos occurred due to toluene contamination. When fact discovery subsequently confirmed that toluene was not used in Gharda's production of chlorpyrifos but that EDC was, he simply changed his opinion to say that EDC contamination was the cause of the fire. When he offered these opinions, he had no basis for knowing whether the chlorpyrifos actually was contaminated by toluene or EDC. The fact that Dr. Armstrong was able to so easily substitute an opinion of EDC contamination for a demonstrably incorrect initial opinion of

toluene contamination further undercuts the reliability of his methodology. *Cf. Comer v. Am. Elec. Power*, 63 F. Supp. 2d 927, 935 (N.D. Ind. 1999) (noting that the ability of a “so-called expert” to change his opinions based on suggestions from counsel demonstrated that the testimony was “nothing more than unscientific speculation” and “mere *ipse dixit*”).

A methodology that is designed to confirm a preconceived conclusion is the antithesis of the scientific method and unreliable by definition. *See Robinson*, 923 S.W.2d at 559. The unreliability of Dr. Armstrong’s method is further demonstrated by his studied refusal to test any of his opinions, indeed, his brazen disdain for the suggestion that testing was “necessary, fruitful or beneficial.” *See Whirlpool*, 298 S.W.3d at 640–42. Accordingly, due to these methodological flaws, Dr. Armstrong’s opinion constituted no evidence of the cause of the fire.

iii. *Dr. Cheremisinoff*

Dr. Cheremisinoff merely opined that it was “quite possible” that flaws in Gharda’s manufacturing process could result in EDC contamination. On its face, this opinion lacks the scientific reliability necessary to be admissible under Rule 702. That assessment is confirmed by the flaws of Dr. Cheremisinoff’s method, which included absolutely no testing. He did not offer any reliable opinion that the Gharda product at issue actually was contaminated. Although Gharda had kept “retains,” samples from the actual batch of chlorpyrifos from

which the product at issue was taken, Dr. Cheremisinoff did not test those retains. He did not perform any other testing to support his opinion that it was “quite possible” that the Gharda product at issue in this case was contaminated by EDC to any particular degree. These opinions constituted no evidence that the chlorpyrifos placed inside CSI’s hot box was actually contaminated by EDC such that it could have spontaneously ignited and started the fire, as assumed by both Russo and Armstrong.

B. Deficiencies of cumulative expert opinions

The majority opinion does not consider the interrelatedness of these opinions or the problems arising from their interdependence. Expert witnesses may rely upon the work of other experts, but weaknesses in the reliability of an underlying witness’s opinion infect the opinions of any other experts who rely upon it.

In this case, CSI attempted to present a case in which multiple experts supplied different pieces of a puzzle:

- Russo, and to a lesser extent, fire marshal Harold Rice, to depict the hot box as the likely origin of the fire, assuming that was possible;
- Armstrong to state that the fire could have started inside the hot box, assuming that the fire actually started there and also assuming that the product actually was contaminated; and
- Cheremisinoff to opine about the possibility of a defect in the product present in the hot box, assuming that the product had spontaneously combusted.

None of these experts offered a nonconclusory opinion with sufficient reliability to snap a single piece of the puzzle into place. Neither Russo nor Rice could reliably determine the fire's origin without confirming a consistent cause. Dr. Armstrong could not affirmatively testify about the cause of the fire without assuming that it had originated in the hot box or without also assuming that a contaminated product was present. Dr. Cheremisinoff could not determine that there was an actual product defect; he could only opine that Gharda's manufacturing process was imperfect and, in light of his assumption that the product had spontaneously burst into flames, that it was "quite possible" that EDC contamination occurred. None of these assumptions turned out to be reliable, considering that each opinion—apart from requiring bolstering from some other proffered expert's opinion—suffered from its own methodological flaws.

In particular, Dr. Armstrong was not justified in assuming that the Gharda product inside the hot box was the catalyst for the fire. That assumption alone effectively assumed the entire dispute in favor of CSI and left Dr. Armstrong in the position of merely explaining a foregone conclusion to the best of his ability. "An expert who is trying to find a cause of something should carefully consider alternative causes," *Robinson*, 923 S.W.2d at 559, but Dr. Armstrong did not engage in that level of inquiry. Assuming the hot box as the place of fire origin excused him from considering the central question that a reliable methodology

would have addressed: Were there alternative possible causes such that it is more likely that the chlorpyrifos did not degrade and ignite the fire? Dr. Armstrong was relieved from this inquiry by simply assuming that the correct location of the fire had been identified and confining his analysis to the restricted universe of factors existing inside the hot box, one of which had to be the cause under his assumed scenario. His assumption did not permit a conclusion that no cause existed inside the box. “An expert’s failure to explain or adequately disprove alternative theories of causation makes his or her own theory speculative and conclusory.” *Wal-Mart Stores, Inc. v. Merrell*, 313 S.W.3d 837, 840 (Tex. 2010) (per curiam) (citing *Gen. Motors Corp. v. Iracheta*, 161 S.W.3d 462, 470 (Tex. 2005)). Because Armstrong’s opinion as to the fire’s cause rests upon an unreliable method, it cannot bolster Russo’s opinion as to the location of the fire’s origin, which in turn assumes the causative element supplied by Armstrong.

Even setting aside the inherently flimsy structure of CSI’s case, with one conditional opinion stacked upon another stacked upon another, each opinion taken individually bears substantial indicia of unreliability. CSI’s expert case is a classic example of opinions which were conducted and formed for the purpose of litigation. *See Robinson*, 923 S.W.2d at 559. Moreover, the experts utterly failed in their responsibility to test their theories. *See Whirlpool*, 298 S.W.3d at 640–42. No testing was conducted to confirm the reliability of the method used to collect

samples, which consisted of placing charcoal badges in the barrels nearly two weeks after the fire. Although CDI's experts ultimately advanced a theory of EDC contamination, the badge testing recorded a greater amount of toluene, a contaminant that was not used in Gharda's production of chlorpyrifos. No testing was performed to exclude the possibility that the EDC, like the toluene, was detected because EDC was present in the air at the location of the warehouse—near the Houston Ship Channel—rather than because EDC was still present in the product days after the fire. Dr. Armstrong did not test his theory that chlorpyrifos contaminated with EDC could spontaneously ignite under the conditions created in the hot box. Dr. Cheremisinoff did not test his theory that the Gharda manufacturing process could result in EDC contamination, nor did he test the actual product retains to determine whether they bore any evidence of contamination.

It was CSI's burden to prove liability at trial, and it also bore the burden of demonstrating the admissibility of its proffered expert opinions under TEX. R. EVID. 702. *See Whirlpool*, 298 S.W.3d at 639 (“The proponent must satisfy its burden regardless of the quality or quantity of the opposing party's evidence on the issue and regardless of whether the opposing party attempts to conclusively prove the expert testimony is wrong.”). To the extent that CSI argued, and the majority opinion relies upon, assertions that it was not possible to perform tests to confirm

the reliability of the methods employed by its experts, that factor does not lower CSI's burden to prove its case, whether through appropriate expert opinion testimony or otherwise. "Testing is not always required to support an expert's opinion, but lack of relevant testing to the extent it was possible, either by the expert or others, is one factor that points toward a determination that an expert opinion is unreliable." *Id.* at 642. "If testing of critical aspects of an expert's testimony has not taken place either by the expert or others in the relevant scientific or expert community, then an explanation of why it has not is an important consideration in evaluating the expert opinions and determining whether they are substantively more than merely the expert's conclusory, subjective opinion." *Id.* at 642–43. The explanations provided by CSI, that testing would have been expensive, time-consuming, inconvenient, or even dangerous, do not mitigate the unreliability of opinions that might have been supported (or discredited) by appropriate tests.

Given the lack of testing, the deficiencies of CSI's expert opinions in this case are similar to those encountered by the Supreme Court of Texas in *Whirlpool v. Camacho*, and the reliability analysis should accordingly be the same. As in *Whirlpool*, CSI's experts' theories were "developed for the litigation." *Id.* at 643 (citing *Robinson*, 923 S.W.2d at 559, for the proposition that "opinions formed solely for the purpose of testifying are more likely to be biased toward a particular

result”). The opinions and theories had not been published in any scientific journal, treatise, or publication so they could be subjected to peer review by someone other than experts retained by CSI in regard to the lawsuit, nor did CSI’s experts indicate that all of the relevant theories had been accepted as valid by relevant scientific or expert communities. *See id.* (citing *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706, 727 (Tex. 1997), for the proposition that the “purpose of publication and peer review is to allow the relevant community to comment on the expert’s theories, findings, and conclusions”). The opinion testimony about the cause and origin of the fire was fundamentally unreliable, and it therefore constituted no evidence to prove the Gharda entities’ liability for damage caused by the fire.

C. Sufficiency of remaining evidence

CSI contends that even without the expert testimony, the jury’s verdict is supported by adequate circumstantial evidence to support the claims against Gharda. I disagree. Even if the circumstantial evidence is sufficient to support a conclusion that the fire started in the hot box and therefore likely originated with the Gharda product, the circumstantial evidence does not prove the causative element necessary to hold Gharda liable for CSI’s claimed damages. As in *Whirlpool*, the other evidence produced at trial and relied upon by CSI’s experts may be consistent with and support a conclusion that fire was in and around the hot

box, but that evidence does prove that the fire originated as CSI's experts said it did. *See id.* (citing *Mack Trucks*, 206 S.W.3d at 580); *see also Merrell*, 313 S.W.3d at 840 (characterizing expert's specific causation theory as "amount[ing] to little more than speculation" because "evidence that halogen lamps can cause fires generally . . . does not establish that the lamp in question caused this fire"). The evidentiary record in this case provides no support for an assumption that a manufacturing defect was the reason for the fire rather than some flaw introduced after the product left Gharda's control or some error committed by CSI, which had control of the product after it accepted delivery.

I would affirm the district court's take-nothing judgment. Because the majority has concluded otherwise, I respectfully dissent.

Michael Massengale
Justice

Panel consists of Justices Keyes, Higley, and Massengale.

Justice Massengale, dissenting.