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**Insurance Law
Property Claims: A Primer**

Demonstrative Evidence - Avoiding Spoliation Claims

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1.0 INTRODUCTION

There are two types of evidence in insurance losses: demonstrative or testimonial. Demonstrative evidence includes evidence addressed directly to the senses, without the intervention of testimony. Such evidence is concerned with real objects, including documents, photographs, maps, charts, diagrams and physical artifacts. The focus of this article is on demonstrative evidence, or more specifically, the tangible items generally found at the scene of a loss, and important considerations for the insurance professional in dealing with these items. It should also be noted that the scene itself may be the “evidence” which is to be preserved. A fire scene with the many smoke and fire patterns is undoubtedly the most easily understood example.

We have all watched “crime scene investigation” type shows, so we understand that blood, tissue samples, bullets and the like are physical evidence that are crucial to the criminal investigation and trial. Highly publicized murder trials like “OJ” have given the public an appreciation of the need to ensure the integrity of that evidence. Tainted or mishandled evidence can result in the outright dismissal of a criminal case.

Unfortunately, the physical evidence that people regularly face at insurance losses is not always treated with the required care. In criminal matters, the crime scene technician is responsible for collecting the physical evidence. That person is a specialist who is trained in the proper methods of evidence recovery and preservation. In the insurance industry, many people could potentially be involved with the identification, recovery and preservation of physical evidence crucial to an insurance loss, yet few have a good understanding of proper evidence handling. The purpose of this paper is to set out a number of aspects relating to the evidence which should be documented or followed so as to ensure its integrity and minimize the chance that the evidence will be spoliated. Of course, the best of course of action would be to retain a forensic specialist to handle the evidence, but that is not always possible.

2.0 CHAIN OF CUSTODY

One of the most important aspects relating to physical evidence is the “**chain of custody**”. In a strict sense, the purpose of maintaining a chain of custody is to ensure that one can prove that the evidence that is presented at a later date is indeed the same evidence that was collected from a scene and has not been altered. A common form of chain of custody record will identify who collected the evidence, where it was originally found, etc., and to whom it was transferred.

¹ I must also credit Rob Sparling of Giffin Koerth for his contributions throughout this paper (rsparling@giffinkoerth.com)

For our purposes as forensic engineers, we prefer to expand upon that very strict notion so as to establish the *who*, *where*, *when* and *how* relating to the evidence, with very specific details at each step, as evidence can be unintentionally and inadvertently altered:

- **WHO** collected the evidence?
- **WHERE** was the evidence collected from?
- **WHEN** was the evidence collected?
- **HOW** was the evidence collected and transported/stored?

The chain of custody record tracks the evidence through time, noting who maintained possession of the evidence, where, and so forth. The need for a chain of custody record may not seem as important in insurance matters as compared to criminal matters (does anyone remember the issue of the blood reportedly found at the crime scene in the OJ matter?), but the lack of one could eliminate any chance for recovery, or a viable defence, in an insurance matter. A record of the manner in which evidence is collected and maintained is very important. We describe below the details of the Who, Where, When and How questions and how a very good record can assist in the loss investigation. Experienced insurance professionals will note that many of the items we describe below are aspects which they would routinely deal with in an insurance loss investigation (for example, asking witnesses to provide their account of the events leading up to and including the event). We are specifically identifying that many of these same aspects should also be considered when dealing with the physical evidence collected at the scene.

Referring back to the earlier example of a fire scene, where the scene itself is the “evidence”, a chain of custody may not appear to apply or be required, as the evidence is not being collected and moved away from the loss location. However, in such a case, scene security and controlled access to the site may be required to ensure that it could be established, at a later date, that the scene was not altered post-loss. In such a case, the chain of custody becomes the records of the security or contracting staff and/or the conditions it was left in (locked, unlocked, security staff posted, etc.) and the manner in which controlled access to the site was provided.

2.1 Who Collected the Evidence?

It is important to document who collected the evidence because they may have information regarding its “as-found” condition and/or they may be able to answer questions regarding its removal, storage in transit, etc., which may arise at a later date. Details such as their name, company the person works for, trade/occupation (if possible), contact information, why that person did the evidence removal/collection (did the insurer ask them to remove it, the Fire Marshal, etc.), and so on should be recorded.

2.2 Where was the Evidence Prior to its Removal?

Implicitly included in this question are details concerning the physical location and environment. It is important when gathering evidence to collect as much information as possible regarding the broader context of the loss. It is often the smallest of details that can lead the forensic investigator to a determination of cause.

Here are some suggestions of what to look for when documenting the conditions surrounding a loss:

1. **Physical Location** - Often the best way to help the forensic investigator is to take lots of pictures. Pictures can provide subtle information that may not be immediately obvious to the photographer. For example, the extremely black soil next to a broken water main could indicate the presence of iron sulphide, a mineral associated with bacterial corrosion. It would not be expected that the insurance professional would know to look for this type of evidence. The picture of the failure location would help the forensic investigator differentiate between chemical corrosion and bacterial corrosion. If taking pictures is not possible (i.e. it is too dark, you can't get the right angle with the camera, etc.), document what you see on paper with sketches and a written description.
2. **Environment** - The physical environment where the object failed can be very important in determining the cause of the failure. An example would be determining whether a leaky home heating oil tank was located in direct sunlight or in the shade. Although not immediately obvious, large temperature swings caused by a home heating oil tank spending part of the day in direct sunlight and cooling off at night can increase the rate of water condensation in the tank, leading to internal corrosion and subsequent leaking. Where possible, it is advisable to document whether the failure location was wet, dry, dusty, clean, windy or exposed to extreme temperature swings, etc.
3. **Witnesses** - Witnesses to failures can provide timelines and sequences of events which may be important in determining the cause of the failure. If someone was present at the time of the failure, document what they saw, heard, smelled, etc. Visual observations such as smoke, steam, and the direction of flying debris can all be important in determining causation. Sounds and smells may also be relevant to the failure investigation. The hissing of a steam hose before it burst could indicate a pre-existing leak in the inner layers of the hose. There may also be relevant information from witnesses who did not necessarily see the event occur, but who may nonetheless have valuable information regarding what was occurring in the hours, days, weeks and even months prior to the event.

Notwithstanding the foregoing comments, one must also be very careful with witness statements, as there has been substantial research undertaken which has shown that witnesses do not consistently provide an accurate account of events, particularly if the event was dramatic, like an explosion or a building collapse. Multiple witness statements which all have a consistent theme are more reliable. If the witness statements do not mesh with the remaining physical evidence, less weight should be given to the statements.

4. **Documentation and History** - Maintenance records, drawings, purchasing records, warranties, manuals and old photographs, etc. can all help in determining why something failed. Collect these documents and forward them to the forensic investigator along with the failed object, or when they are obtained.

2.3 When was the Evidence Collected?

Timing of the evidence collection is important: the sooner the better! Many forms of evidence can quickly degrade over time, thus it is important to be able to document that the evidence was collected in a timely fashion. A simple yet all too common (unfortunately) aspect of lost information relates to threads on nuts and bolts. Timely collection and preservation of the evidence may provide the

forensic engineer evidence regarding the timing of the event: was the nut loose for an extended period of time, or not?

2.4 How was the Evidence Collected and Transported/Stored?

Improper gathering, handling, storage and transportation of evidence can lead to important information being lost.

Here are some pointers for gathering evidence and protecting failed objects from damage:

1. **Evidence Removal** - If something has to be taken apart or cut in order to remove the evidence, document how the material was removed. Take pictures before, during and after removal. Document what tools were used. This will assist the forensic investigator in distinguishing between damage that occurred as a result of the failure and damage that occurred as a result of the evidence removal. Again using the nut or bolt example, did the rounded edges of the nut or bolt head occur when the evidence was removed from the scene, or was it evidence that it had been improperly installed or repeatedly re-tightened, etc.?
2. **Gather Associated Evidence** - Water from a leaking pipe may contain chemicals or microbes that led to the leak. Oil from a failed engine may have metal filings in it. Soil from the area around a burst pipe may have materials which led to the corrosion of the pipe. Find suitable clean containers and keep a sample of any materials that may be associated with the failure.
3. **Contamination by Touch** - Environmental attack and corrosion are often caused or accelerated by chemical compounds. Our hands are covered by oils, salt, grease, and dust which can all be transferred to the failure surface. This may lead to incorrect conclusions and false determinations of cause. Wear gloves to prevent inadvertent contamination and store the material in clean containers.
4. **Leave the Dirt** - Don't clean it - the dirt may be important. Often the environment in which something failed plays an important role in why the failure occurred.
5. **Fracture Surfaces** - Never put fracture surfaces back together. We are all tempted to put the two parts of the broken bolt back together: "Hey, these two pieces fit perfectly together!", but in doing so we can damage the surfaces making identification of the cause of failure difficult.
6. **Suitable Containers** - If the object being collected is small, Ziploc bags make excellent storage containers for evidence. If Ziploc bags are too small or not available, new plastic boxes or food storage containers are the next best choice. Plastic wrap or bubble wrap works if suitable containers are not available. Always wrap the object well before putting it into a cardboard box. Capture liquids in clean appropriate bottles, jars, or cans. Seek qualified assistance when handling hazardous or flammable chemicals.
7. **Protect Evidence from Water Damage** - Water can lead to corrosion, mould, physical and/or chemical changes in material. Whenever possible, store failed objects in dry sealed containers or bags to prevent damage from occurring. If a failed object is wet, collect some

of the water in a jar or Ziploc bag and then allow the object to dry before storing it in a dry container or bag.

8. **Labelling the Evidence** - Mark on the container holding the evidence where it was gathered, who gathered it and when it was gathered. This will help prevent the evidence from being lost or mixed up, especially if identical exemplar items were also collected from the scene.
9. **Extreme Temperatures** - Freezing and thawing conditions can damage materials containing water. High temperatures can melt waxes or plastics. It is always best to store evidence in a cool (10°C to 25°C) area.
10. **Protect Plastics from UV Light** - Many plastics, glues, rubbers and paints are sensitive to ultraviolet (UV) light. The fluorescent lights in office buildings produce a significant amount of UV light. Materials should be stored in boxes or bags which prevent UV light from degrading them. Leaving the evidence exposed on your desk while you decide whether or not you will pursue subrogation may seem ok, but exposure to the UV light and from handling by your colleagues ("Hey that looks cool, what is it....?") may spoliage the evidence.
11. **General Handling Damage** - A failed wire that is subsequently kinked or a hose that is bent to the point where it does not spring back to its original shape during inspection are both examples of handling damage. It is important that forensic investigators do not mistakenly interpret damage caused during handling as contributing factors to the failure.
12. **Transportation** – If you collected the evidence, how are you going to get the evidence to your forensic engineering consultant? Obviously if it's large, you likely do not have it in your possession, so for the most part we can assume that it is a smaller object, easily transported. Are you going to courier it, or deliver it in person? Clearly the financial considerations will likely dominate – if it is a \$20,000 loss it probably isn't worth it to hand-deliver the item. On the other hand, if it's a \$500,000 loss, hand-delivery probably is more sensible. Further, what is the nature of the part? If it's a solid, durable item like a bolt or a section of steel pipe, it is unlikely to be damaged to any meaningful degree in transit. But if it's a fragile glass bulb.....When in doubt, speak to the firm that you regularly rely on for such assistance before you transport the evidence to them.

3.0 PRESERVATION OF EVIDENCE IN THE FACE OF EXAMINATION AND TESTING

The title of this Section is misleading, as it may not always be possible to "preserve" the evidence when testing is performed (i.e. - destructive testing). It may be necessary to perform destructive testing or examinations in order to accurately determine the specific cause of the failure, particularly for more complicated devices with many parts. For example, if a clothes dryer has been involved in a fire, with the apparent failure located within the dryer enclosure, it would be necessary to disassemble the dryer to determine what failed. Depending on what the failure involved, the very disassembly of that dryer cabinet could later be considered to be a destructive examination.

This section will discuss some ways to ensure that potential conflicts or issues are minimized. While the insurance adjuster or lawyer likely won't be the person conducting the examination or test, it is nonetheless useful to understand why the engineer is proposing certain things and where the cost for the work originates.

3.1 Reasons for Examinations and/or Testing

Where a loss has occurred and a device, part or appliance is suspected to have caused or contributed to a loss, it may be necessary to examine and potentially test the item to confirm that was the case. Some examples include:

- Stoves, coffeemakers, microwaves alleged to be involved in a fire;
- Laptop computers and other rechargeable battery driven devices alleged to be involved in a fire;
- Industrial equipment alleged to have malfunctioned, resulting in a fire, injury or loss of product; and,
- Ladders alleged to have failed, causing someone to fall and become injured.

3.2 Item Identification

It is important to note the make, model, serial number and any other features that will allow for the proper identification of the manufacturer so that they can be put on notice, if required. This seems like an obvious point, but it is surprising how many times we have been asked to find out why something failed before the manufacturer has been identified. An equally important reason to identify the manufacturer is so that you can provide them and any related parties (suppliers, installers, distributors) with adequate advance warning of the intent to perform potentially destructive examinations and/or testing and invite them to attend. Further, it may be determined that the manufacturer is overseas, which may make successful litigation unlikely or, at the very least, extremely costly. Decisions regarding continuing the investigation should consider these aspects.

3.3 Determine Possible Failure Scenarios

It may seem like “putting the cart before the horse” to come up with some ideas of how the item could have failed, prior to examining it for the purpose of more conclusively determining that very point. However, different failure scenarios could result in different consequences for that item, which may require different investigation techniques. For example, if the loss is suspected to involve an electric circuit breaker, such as you can find in your house electrical service panel, possible failure scenarios could include:

- The device failed to trip due to an internal part that broke;
- The device failed to trip because one of the internal parts had deteriorated;
- The device did trip but the flow of electricity was not interrupted because the internal contacts had fused together; or,
- The circuit breaker was the incorrect size for the electrical circuit.

The last scenario would be verified simply by examining the size of the wires that the circuit breaker supplied - the breaker probably would not need to be tested. This is a great example of why it is important not to look just at the evidence, but the surroundings it is in, how it was connected or positioned, etc. If you simply deliver the breaker to a forensic engineer to see why it failed, a crucial piece of documentary evidence would be missing and money might be wasted following the incorrect investigation path. The other three scenarios could each be approached differently, but until one knows which scenario is more likely, the examination and/or testing should try to cover all possible scenarios. One example would be to x-ray the breaker, to discover, if possible, what condition the

hidden, internal components appear to be in. If the contacts are not fused, that should be apparent. If parts are broken, that should be apparent. Then, the next steps can be decided upon.

3.4 Non-Destructive Testing

There are a variety of non-destructive tests (NDT) that can be employed in many instances, especially when the failed item is a simple device, such as failed pipes or hoses, failed couplings, failed steel building elements, etc. Some of these NDT include x-ray, dye penetrant testing, magnetic particle testing (MT) and scanning electron microscopy (SEM). However, there is a limit to how much information can be obtained from such NDT. For example, with metal materials it may be necessary to cut small samples from the evidence to perform more detailed metallurgical examinations. These samples are mounted and polished to show the composition and underlying microstructure of the metal. This can reveal if the metal was properly cast/forged/extruded, etc. These small samples, may not qualify as true “destructive tests”, if the evidence has essentially not been destroyed (e.g. - if the evidence is a large steel beam that failed, removing a small sample from the other end of the beam, away from the specific failure site, will effectively not alter the evidence).

3.5 Develop an Examination and Testing Protocol for the Subject Evidence

A protocol provides a clear and specific set of examinations and tests which can be distributed to all interested parties for discussion and (hopefully) consensus, prior to any work beginning. This limits the ability of any one of the parties from claiming, after the fact, that the evidence has been spoliated. It is often through the development of the draft protocol and the subsequent discussions that potential problems are discovered and hopefully eliminated. However, even the best laid plans can go awry, so sometimes on-the-spot changes are required during the examination and testing phase.

The protocol should be very specific and should describe any steps which could potentially affect the condition of the evidence. Simple things like the mode of transport of the evidence to the test facility could be very important. If the evidence is susceptible to damage from extreme cold, for example, and it is shipped in the middle of the winter to a test facility and kept in an unheated storage area until the scheduled test date, the evidence could be spoliated. If the protocol had described the transport and storage conditions, and if the protocol was distributed to the manufacturer of that item, they should make it known that the evidence is susceptible to damage from exposure to extreme cold conditions. Otherwise the manufacturer would have difficulty making a claim for evidence spoliation.

3.6 Documentation, Documentation, Documentation

If “Location, Location, Location” is the catch phrase for successful real estate ventures, then “Documentation, Documentation, Documentation” is the catch phrase for successful handling of evidence, from its removal from site through to its examination, testing, eventual long-term storage and finally its use in the resolution of the matter and its ultimate disposal. This means that good notes, diagrams, photographs and even videotaping may be required.

It may not be possible for the evidence to be removed from the site without some alteration of its immediate post-loss state. For example, if the evidence includes severely fire damaged components, simply transporting it away from the scene may cause it to deteriorate badly. In such cases, copious notes and/or photographs are a must. It may also be advisable to notify potential other parties immediately, so that they can examine the evidence in-situ. Further examinations and testing may be

required later in a laboratory setting, but at least the other parties can not claim any prejudice if the condition of the evidence changed during removal and transport away from the scene.

During the laboratory examination and testing, even if all relevant parties are present, it is important to document the relevant findings through each step of the process. This minimizes the opportunity for another party to gloss over or ignore critical findings that may factor in to the final conclusion as to cause. There is nothing worse than to get to the end of a machine disassembly and find something different from what is expected, only to realize that the relative position of certain switches or valves may have explained why the findings were different. A well documented examination will maximize the chances for success in your case.

4.0 EXAMPLES

This Section provides a number of example scenarios to show how evidence handling can impact the outcome of an insurance loss investigation.

4.1 Machine Part

In one instance we were asked to determine the cause of failure for a machine part thought to have been involved in a loss. The part was given to us by an insurance industry professional, who was not the person that had removed the part from the scene. We observed damage to the part, but because no history was provided, the origin of observed damage to the part could not be ascertained. Thus we were not able to eliminate the possibility that the damage was created by the prior handling of the evidence rather than the use or abuse of the part while it was in service. By the time those questions arose, it was already months after the evidence had been initially collected. There was no way to reliably determine who else had handled the part. Information from those individuals could have clarified the condition of the part when it was collected. Therefore, without it, the case was weakened.

4.2 Hot Water Pipe

A large heating water pipe fails, causing millions of dollars of damage. First on the scene to deal with the loss is the emergency services contractor, retained by the property insurer. The contractor removes the failed section of pipe (which is important physical evidence) and replaces it. The pipe is thrown in the back of a truck and taken away to a shop, to be examined at a later date.

Months later, the pipe is delivered to a forensic engineer to establish the cause of the failure. The engineer examines it and concludes that the failure occurred due to corrosion and prepares a report for the insurer. Based on that report the insurer subrogates against the company that was responsible for maintaining the mechanical system in the building. The mechanical company retains their own forensic engineer, who performs a detailed assessment of the matter, including an examination of the site and a review of how the physical evidence was collected and stored. The engineer discovers that the truck which the pipe had been thrown into when it was taken from the site was used by the contractor for other purposes. He had a sideline business salting driveways and sidewalks. The engineer also discovers that the pipe was kept for months in a damp and moist environment and ultimately concludes that the manner in which it was collected and stored contributed to the pipe corrosion. The insurer's case against the maintenance company suddenly does not look as strong.

4.3 Water Loss from Washing Machine

There was a large property loss resulting from water that escaped during a washing machine flood. Based on the insured's description of the flooding event, it was suspected what might have caused it; a disconnected hose to the water fill switch, which was contained within the machine cabinet. However, because that particular hose could easily be inadvertently disconnected during disassembly of the outer casing of the machine, no disassembly of the machine was performed until representatives from the manufacturer were present. The subsequent examination, with all interested parties present, revealed that the hose was indeed disconnected, and could only have become disconnected due to a manufacturing problem (not a user problem). Because no disassembly of the unit had occurred prior to all parties being present, there was no dispute as to whether or not the hose had become disconnected by the person who collected and retained the evidence. While it is likely that a well-documented disassembly process could have been relied upon to show that the hose was originally in that state, it was much more compelling when the discovery was made when all parties were present.

4.4 Cleaning Up the Fire Scene

There have been many examples of fire scenes where the insurer has authorized the restoration contractor to "start the cleanup" prior to the commencement of the fire investigation. The electrician comes in to provide temporary power and lighting, and in doing so, completely obliterates any potential information that the power distribution panel might have yielded (e.g. - tripped breakers). The cleaners remove "garbage", which might have held useful clues. Soot stains are cleaned. The possibilities for evidence spoliation claims in this scenario are numerous.

Many insurers or independent adjusters will defend their actions by saying things like "the fire clearly started in the kitchen and we left the kitchen alone until the fire investigators got here". Unfortunately, items like power distribution panels, vent piping and so forth, often located outside the area of apparent origin, may contain clues. Furthermore, what appears to be a kitchen fire, for example, may actually be an attic fire where drop-down burning in a vertical chase caused the fire to spread to the kitchen, making it appear (to the untrained eye) that the fire started in the kitchen. In many cases the remaining evidence is nonetheless overwhelming and claims of evidence spoliation are thus negligible, but do you really want to chance that?

5.0 SUMMARY

Demonstrative evidence is often the proverbial "key" upon which the success of a subrogation case rests.

The most important aspect relating to demonstrative evidence is the "chain of custody" for that evidence. *Who* collected it? *Where* was the evidence collected from? *When* was it collected? *How* was the evidence collected, stored and transported? If too many of these questions cannot be answered, your case may be substantially compromised. We strongly recommend that a firm specializing in forensic engineering investigations be retained prior to evidence removal to maximize your chances for subrogation success.

If you get to the stage of having the evidence examined, be aware that destructive testing or examination could alter the evidence, such that spoliation claims by other parties may be successfully advanced. Careful consideration of the nature of the evidence and the loss must be made and, preferably, all interested parties that you are reasonably aware of should be invited to participate and reasonable scheduling considerations should be provided. Such participation should not be limited to mere attendance at the evidence examination and/or testing activity. Interested parties should be invited to approve of the testing protocol your forensic consultant is proposing. If it's just a nut that cracked, it may seem obvious, but that may not be the case, as your consultant may want to examine the nut and then have it sectioned, to expose the fracture surfaces, for example. In that case, if the other parties were not invited and/or not aware that the nut was going to be sectioned, they may have a legitimate spoliation claim.

Careful attention to the details will ensure the maximum chance of success.