March 2008 Product Liability

Lithium-ion batteries: an emerging focus of causation in consumer product fires

By H. Michael O'Brien and Gregg A. Tatarka

As more portable electronic devices flood the market, more lithium-ion batteries will be needed to power them. With demands for smaller, lighter and more powerful electronic devices, manufacturers must develop more powerful batteries that keep pace with them. The increase in more powerful batteries in the marketplace presents various issues, such as failure of safety devices, inferior after-market and counterfeit products, consumer misuse and abuse, more high profile recalls, greater media attention and publicity about alleged battery failures, more federal regulations, and increased claims against manufacturers or insurers. The widespread use of products containing lithium-ion batteries makes them an object of increasing claims, and as such, manufacturers and insurers must be prepared to investigate battery failures thoroughly and plan a vigorous defense strategy.

Background

In 1991 Sony introduced the first commercially available rechargeable lithium-ion battery, which has changed the landscape in sales and designs of consumer electronics, and concurrently, the investigation and defense of consumer product fires. The advantages the lithium-ion battery possesses over other portable energy sources guaranteed that it would dominate the consumer portable electronics market. However, the very characteristics that make the lithium-ion battery so desirable to manufacturers and consumers alike also make the battery a potential target in fire investigations.

In the early 1970s lithium batteries hit the commercial market. These batteries contain strips of lithium metal. Lithium is the third lightest element, and the lightest metal. This allows lithium to have a very high energy density, meaning that it can store a considerable amount of energy versus its weight. Efforts to create rechargeable lithium metal batteries were largely unsuccessful because of lithium's unstable nature. Researchers then began theorizing that a lithium-ion battery cell could provide the same benefits as a lithium battery, and eliminate some safety concerns.

While research was being conducted to develop a stable lithium-ion battery cell, nickel-cadmium and alkaline batteries were the primary power sources for portable electronic devices. Alkaline batteries, which dominated the battery market, are the most familiar type of battery cells. They may only be used once, are heavy and possess a relatively low voltage output. Nickel-cadmium cells are rechargeable, but suffer from memory effect, where the cells lose their maximum energy capacity. This often results from consumers recharging a nickel-cadmium cell prior to it fully discharging. The nickel-metal-hydride battery was introduced around the same time as the lithium-ion battery. It is rechargeable and does not suffer from memory effect, but it suffers from a low voltage output of 1.2V per cell, has a high auto-discharge rate, and is a heavy cell. Lithium-ion batteries, however, are rechargeable, do not suffer from memory effect, possess a much higher energy density than other batteries, have a slow auto-discharge rate, and are very light. A single Li-ion cell operates at 3.7V (nominal), three times that of the nickel-based batteries. Further, a lithium-ion battery cell can be formed and molded into a wide variety of shapes or sizes. These advantages are what have led to the prevalence of lithium-ion batteries as the manufacturer's choice in consumer electronics, despite higher production costs versus other battery types. It is estimated that 1 billion Li-ion cells were produced in 2006, and that more than 2 billion were produced in 2007. As a result, production costs have decreased as production volumes have increased.

How It Works

The lithium-ion battery works just as its name implies: the ionic current inside the cell is what produces the energy, or electrical current, for the electronic device. The Li-ion cell possesses a carbon anode (+), a metal oxide (lithium and cobalt) cathode (-) and lithium salt in an organic solvent electrolytic solution. A lithium molecule leaves the carbon anode and loses a negatively charged electron, leaving behind a lithium ion. The lithium ions flow through the organic solvent solution

between the anode and the cathode. The electrons flow through the external device, thereby completing the electric circuit. An accumulation of lithium ions on the cathode causes the cell to produce less voltage, indicating a recharge is needed.

Devices and Uses

Lithium-ion batteries have become synonymous with portable electronic devices. The most prevalent examples of portable electronic devices that employ lithium-ion batteries have become mainstays of our lives: cellular phones, notebook computers and portable music players. In 2006, worldwide sales of cellular phones topped 800 million units. Total sales for portable music players in 2006 topped $6 billion. Nearly 80 million notebook computers were sold worldwide in 2007. Other devices using lithium-ion batteries include satellite radio receivers, portable GPS devices, digital cameras/camcorders, radio-controlled toys and portable DVD players. These batteries are also being used more frequently in products outside of portable electronic devices, such as portable power tools, medical devices/equipment and automobiles. Consumer reliance on these products, and consequently lithium-ion batteries, increases more with each passing year and each new unveiling of the next "must have" device. As consumer demand increases the battery supply, it also increases the likelihood that more reports of battery failures will surface in the coming years.

Safety Precautions

Metallic lithium, in and of itself, is an unstable element; however, there is no metallic lithium present in a Li-ion cell. Nonetheless, the combination of flammable organic solvents and a high energy density creates the potential for battery cell failures resulting in explosions or fires. This has caused Li-ion battery manufacturers to build in redundant safety precautions for each battery cell. First, there is a shut-down separator, a porous polypropylene or polyethylene film that separates the lithium electrodes, to prevent the over-heating of a cell. This film is designed to close its pores when internal temperatures reach 266°F. The closed pores prevent the ionic current from flowing, which ceases the production of an electric current and heat. In larger battery cells, such as those that power notebook computers, there is a tear away tab that shuts the cell down if internal cell pressure increases; on all cells, there is also a vent to relieve any excess internal pressure. Larger cells also have a thermal-interrupt, which shuts the cell down should an over-current or over-charge occur. Lastly, there is either a microchip or some type of circuit or protection device incorporated in the battery pack that acts like a fuse to shut down the cell should a failure begin to occur or the voltage or current spike to unacceptable levels. Though original equipment manufacturer (OEM) battery suppliers will include all appropriate safety devices, many after-market batteries may not contain all appropriate safety devices; counterfeit batteries are likely not to contain any.

The lithium-ion battery cells for hybrid automobiles have different chemistries and characteristics than those for portable electronic devices and therefore require different protections from those for the standard consumer electronic device. Additionally, an automobile may be subjected to great impact forces in an accident, plus there is the presence of gasoline. The battery cells and packs for hybrid automobiles have electronic cooling systems and multiple fuses and sensors to shut down cells in the event of a thermal runaway, impact or rollover. Some of the hybrid-car Li-ion battery packs are designed with thousands of small cells so that each cell stores only a small amount of energy. Each cell is then encased in steel and then the entire pack is also encased in steel.

While these devices and precautions are aimed at decreasing the probability of a disastrous failure, the possibility of a failure can never be fully eliminated. As manufacturers meet consumer demands for smaller, lighter and more powerful portable electronic devices, they must develop smaller, lighter and more powerful batteries. This, in turn, can lead to changes in the battery safety features, such as a reduction in size of the shut-down separators. Naturally, as more and more lithium-ion batteries enter the market, there will be an increase in the reports of battery failures. The increased reports may be attributed to more counterfeit products being produced, or to the rise of inexperienced manufacturers outputting products.

Failures

The most serious failure potential for a Li-ion cell is thermal runaway, which can be caused by many different means. A thermal runaway can result from things such as user misuse/abuse, exposure to high external temperatures, over-charging or

over-current, or a manufacturing defect. Thermal runaway in a Li-ion cell can produce internal temperatures hot enough to melt aluminum (melting point 1220° F) and could cause a battery cell or pack to explode.

Thermal runaway causes a rise in the pressure inside the cell, which results in the cell expanding or bloating – a common sign that a Li-ion cell has failed. It should be noted that cells will swell from events that are not indicative of a failure, such as: normal cycling; moderate thermal exposure; moderate over-charge; or over-discharge. The rise in heat and pressure along with the presence of flammable and volatile organic solvents creates the potential for a cell exploding and causing a fire. In a less dramatic fashion, a slow temperature rise equals a slow pressure rise and may result in the battery cell leaking or melting.

Though a battery may contain some or all of the safety devices mentioned above, user abuse (dropping, throwing, puncturing or exposing to external heat sources) can degrade or counteract the internal safety precautions and lead to a failure. Impact or shock forces could cause a failure or puncture of the polypropylene film inside the cell and cause a thermal runaway. Most surprisingly, external temperatures of only 140° F can contribute to thermal runaway in a Li-ion cell.

Over-charging or an over-current could also cause a cell failure. Both result in thermal runaway when the rate of lithium ions being transferred is too fast, but have different failure modes. In an over-charge, the electric current from the recharge power source causes the lithium ions to transfer from the cathode to the anode too quickly. Imagine trying to put two gallons of water in a one-gallon container. Over-charge results in an accumulation of metallic lithium on the carbon anode surface. It is interesting to note that an exothermic (heat producing) reaction results when lithium metal is introduced into the organic solvent electrolyte solution. As explained above, the increase in internal cell temperature causes an increase of internal cell pressure and may cause an explosion or fire. For an over-charge to result in a failure, the redundant safety precautions of the battery cell and those of the product/charger must all fail. To prevent an over-charge, for example, many cellular handsets now incorporate a charging control circuit safety feature that stops the charging process when the battery cells have reached charge capacity. Therefore, for an over-charge failure to occur in a battery pack for a cellular handset with this feature, the charging control circuit, the battery pack's protective circuit, and other internal cell protection devices must fail. Nonetheless, it is possible for an over-charge to occur when a consumer uses a charger not designed for a battery pack.

In an over-current, the cell produces more electric current than it can handle and short-circuits, which can cause overheating. An internal short circuit could ignite the organic solvents inside a battery cell, and cause a fire or explosion.

Lastly, impurities inside the cell, commonly in the electrolyte solution, can cause the protective separator film to puncture or tear, which can lead to a battery failure. These impurities enter the cell during the manufacturing process and are presumably more common in after-market or counterfeit batteries, where the manufacturing process may not be as rigid or quality controls not as tight as those of OEM suppliers.

Despite the above, user abuse or misuse is often the true cause of a battery failure. Naturally, many claimants, whether direct claimants or insurance subrogation claimants, will deny that the product or batteries involved were ever misused, abused, or used with potentially incompatible after-market accessories, such as car-chargers.

After-Market & Counterfeit Batteries

Of the potential problems consumer product manufacturers or distributors may face in handling a product fire investigation involving a lithium-ion battery, after-market and counterfeit lithium-ion batteries prove particularly troublesome and costly. These issues have become prevalent in investigating personal injury and property damage claims.

Though they are lumped together, after-market batteries and counterfeit batteries are separate and distinct. An after-market battery is one manufactured under a brand name and often marketed as a less expensive alternative to an OEM component. After-market batteries may also contain features that OEM batteries do not, such as blinking or flashing lights, which have been commonly seen on cellular handsets. Though after-market batteries may provide a lower price or more attractive features or accessories, the consumer may not consider that the battery may not be compatible with the product or the OEM charger. As described below, incompatibilities between the battery, product and charger can lead to a failure.

A counterfeit battery, however, is one that is made to look like an OEM supplier's product, but that is often where the similarities end. In 2003 an estimated 5 million counterfeit cellular phone batteries were seized worldwide. The problem has become so widespread that some manufacturers have links on their websites to inform consumers about how to spot counterfeit accessories, such as battery chargers. As mentioned above, counterfeit batteries or their chargers often lack the inherent safety devices that are commonplace in OEM and after-market batteries, which makes counterfeit batteries more susceptible to failures. Counterfeit batteries primarily enter the stream of commerce through either unauthorized retailers who knowingly sell counterfeits as originals or through authorized retailers who are unknowingly provided with counterfeit products. Counterfeit batteries increase the cost in investigating claims or incidents, as the product manufacturer, retained experts and lawyers have to spend time and money on determining whether the failed battery is legitimate. Those who counterfeit the batteries make them so that they are indistinguishable from the originals, based on a visual observation. Sometimes, X-rays are needed to confirm whether a battery is an OEM or counterfeit. Usually, by the time the cells are X-rayed, the product manufacturer or insurance carrier has spent a great sum of money investigating the matter.

Aside from the increased cost in investigating a singular incident, counterfeit batteries expose product manufacturers and distributors to increased financial costs over a broad spectrum, bad publicity and negative consumer reaction. In 2003 the press latched onto incidents of cellular phone batteries causing personal injury or property damage. The root cause of the majority of these initial incidents was after-market batteries that were not truly compatible with the host device/charger. Notably, in February 2003, Nokia released a press report confirming that it had received reports of cellular handset batteries overheating in the European, African and Asian markets. However, Nokia's investigation revealed that these incidents were primarily caused by after-market batteries combined with user abuse. In one incident, a Nokia cellular handset exploded in a woman's face after she dropped the handset and subsequently powered it on. The failure was blamed on the after-market battery, which lacked some of the standard internal safety precautions of the OEM battery.

In 2004 the United States Consumer Product Safety Commission issued a statement that it received 83 incident reports of cellular phones exploding or overheating during the prior two years, often with complaints of burns to the leg, hip, neck and face – common areas where cellular handsets contact the body. In response, many cellular phone manufacturers shifted the focus onto after-market or counterfeit batteries, stating that failures could result from incompatible or faulty batteries or chargers.

Also in 2004, Kyocera Wireless recalled 1 million lithium-ion cellular handset batteries because of a threat of an internal short circuit that could lead to an explosion, fire or overheating. The batteries were manufactured as after-market accessories by a former OEM battery supplier of Kyocera. As sometimes occurs in emerging manufacturing communities some suppliers of OEM batteries do use their knowledge and excess materials to make after-market, or even knock-off, batteries. Nonetheless, Kyocera absorbed the costs and the public relations hit of this recall.

Even when it is clear that an after-market or counterfeit battery is involved in an incident, a manufacturer may still be sued and may elect to settle rather than litigate. Recently, *Johnson v. Nokia Inc., et al.* was decided in a Florida state court. The plaintiff, a teenage girl, suffered a third-degree burn to her leg after an after-market battery for her Nokia cellular phone malfunctioned. Nokia reached an out-of-court settlement with the plaintiff for an undisclosed amount. Therefore, not only are after-market batteries eating into a manufacturer's sales, they also cause the manufacturer, or its insurer, to incur expenses in the investigation, defense and settling of claims or litigation.

Incidents and Recalls

Since 2003 the CPSC has received more than 300 reports of lithium or lithium-ion batteries overheating or exploding in portable electronic devices. The Federal Aviation Administration has recorded 60 battery-related incidents on planes or in cargo areas since 1991.

What must be considered and realized is that the number of reported and documented incidents is an incredibly small percentage of failures versus the billions of lithium or Li-ion battery cells that have been produced. It should also be noted

that a good portion of the claims that are initially reported in the press or by claimants as possible battery failures turn out to be something else entirely. Nonetheless, consumers and insurance subrogation claimants react more to the possibility of a failure than the probability that one will occur. No doubt, this has been sparked by the recent and much publicized recalls and "viral video" postings on the Internet that depict what could happen when a battery fails. A Dell notebook computer burst into flames at a conference in Japan in June 2006. No one was injured, but this was one of the few spontaneous incidents caught on film. The images from this incident circulated through the media and Internet. This, in turn, increased the perceived danger of Li-ion batteries and prompted many what-if scenarios: what if this happened on a plane; what if this happened on a user's lap; what if this happened on a couch; what if this happened to me.

Despite their safety precautions, both lithium and lithium-ion batteries are considered "dangerous goods," in terms of shipping and transport. The first major incident involving lithium batteries occurred in 1999 on a Northwest Airlines passenger flight from Japan to Los Angeles, where a fire originated in a cargo shipment of 120,000 lithium batteries. Since then, bulk shipments of lithium batteries have been banned on passenger flights. Cargo shipments, however, have not escaped incidents. There have been nine fires that have occurred in airplanes or cargo areas since 2005. In 2006 a UPS cargo flight had an emergency landing in Philadelphia because of a fire. Though this incident is still under investigation, some have opined that the fire started in a shipment of lithium-ion batteries. In response to these incidents, the FAA has asked battery manufacturers and suppliers to voluntarily increase shipment safety precautions, such as placing the shipments inside fireproof containers. The FAA and the Department of Transportation have also considered restricting lithium batteries in checked luggage, but not carry-on. In fact, the DOT will soon require passengers to put all lithium and Li-ion batteries in their carry-on luggage. Also, the United Nations is considering bringing the batteries under the category of hazardous materials/goods for 2009.

The CPSC has been the governmental agency most involved in Li-ion battery issues and has been involved in several high profile recalls of battery packs. The most prominent of all the recent recalls is the August 2006 Dell recall, in which more than 4 million Sony-manufactured lithium-ion battery packs were recalled because of a possible fire or injury hazard caused by metallic impurities inside the affected cells. As mentioned above, metallic impurities within a cell can cause punctures in the protective separator film, which may lead to an internal short circuit. This recall touched a nerve with consumers, insurance subrogation claimants, and manufacturers alike because it involved two prominent names in consumer electronics/computers and involved OEM battery packs. It is expected that this recall will cost Dell and Sony in excess of $500 million.

This recall was the tip of the iceberg for recalls and the dissemination of information regarding possible hazards of lithium-ion batteries. After the Dell battery recall, other computer manufacturers recalled battery packs, citing consumer reports of overheating, injury or fires. Nearly two weeks after the Dell recall, Apple Computer announced a recall of nearly 2 million Sony-manufactured lithium-ion battery packs. From 2006 to 2007, Sony, Lenovo/IBM, Panasonic, Toshiba, Hitachi, Acer, Fujitsu, Gateway, NEC and Sharp all recalled Sony- manufactured lithium-ion batteries. It is estimated that since August 2006, more than 10 million Sony battery packs have been recalled worldwide.

Though the Dell recall is the most well known, and Sony was the hardest hit battery manufacturer, there were other, less publicized, recalls involving notebook computers in the preceding years. In many of these reports, the battery manufacturer is not even identified. In 2000 Dell recalled 27,000 batteries following a report of a battery pack short-circuiting and causing a small fire. Dell also recalled 22,000 batteries in 2005. In 2000 Compaq recalled 55,000 battery packs for fire hazard concerns following a report of a battery pack causing a small fire. In 2004 Apple recalled 28,000 lithium-ion battery packs and in 2005 recalled 128,000 battery packs – both of these recalls involved packs manufactured by LG, in which the concern was the possibility of an internal short causing a fire hazard. Hewlett-Packard in 2005 announced the recall of 135,000 battery packs, and another 15,700 in 2006. In June 2005 an after-market notebook computer battery manufacturer, Battery-Biz, recalled 10,000 battery packs due to reports of overheating and melting from an internal short. Lenovo has recalled more than 200,000 lithium-ion battery packs manufactured by Sanyo because the packs could pose a fire hazard if subjected to an external impact force. In June 2007 Gateway recalled 14,000 lithium-ion battery packs because of overheating. The CPSC notice specifically stated, "This is not an internal battery cell defect." This statement begs the question: If this is not a defect, then why the recall? This recall raises the inference that because the battery packs run hot, it may become incumbent

upon the manufacturers or distributors to either recall batteries or to conspicuously notify consumers of the potential for damage or injury from the heat the batteries emit.

Notebook computers, however, have not been the only products subject to a battery recall. This is a sample of other products involved in battery recalls:

- EV Global Motors Co. recalled 2,000 lithium batteries used in electrical bicycles in September 2002, based on reports of overheating and fires.
- In February 2006 Polycom Inc. recalled 27,700 wireless conference phones worldwide because of reports of the lithium-ion batteries overheating, causing minor property damage.
- Nikon recalled 700,000 Chinese-manufactured digital camera battery packs following reports of overheating and minor property damage.
- JAKKS Pacific Inc., in February 2007, recalled 245,000 Li-ion battery packs for a toy vehicle following more than 30 reports of the batteries melting or igniting while charging.
- In March 2007 Estes-Cox Corporation recalled 66,000 radio-controlled airplanes because of reports of overheating during charging, including a minor burn injury.
- In September 2002 Galls Inc. recalled 10,000 lithium batteries supplied with flashlights because of five reports of overheating or explosions.
- Dorcy International Inc. recalled 20,000 batteries in February 2004 for the same reason.
- Browning recalled 12,500 flashlight batteries in January 2004.
- Clarion Corporation recalled 2,500 batteries for navigation systems in December 2006.
- In October 2006 Light & Motion recalled 1,700 Li-ion batteries for bicycle lights.
- In March 2006 a total of 231,000 after-market battery chargers for the Sony PSP were recalled because of a defective circuit board that posed a fire hazard.
- In November 2004 Black Diamond Equipment Ltd. recalled 1,000 Li-ion batteries for a headlamp flashlight.

When most people think of a battery failure and personal injury, the first thing that comes to mind is a burn. However, there have been claimants who have alleged that they have inhaled or been exposed to the contents of a battery cell, after venting/failure, and have thereafter allegedly experienced ill health effects. The safety data sheets for Li-ion batteries generally acknowledge that minor skin, throat, or airway irritation could result from a singular exposure. Nonetheless, some claimants have alleged chronic conditions after one exposure. While the facts and merits of these claims have not been borne out, the plaintiff's bar could liken this exposure to that of asbestos or other now known carcinogens.

Very few true battery failures used to be photo- or video-documented at the time of occurrence. Today, however, there is the modern phenomenon of the consumer who intentionally causes a battery failure, either for fun or for "educational purposes." These consumers will typically remove or bypass the battery safety devices and intentionally short-circuit or over-charge the battery to videotape the spectacular results of a battery failure. These videos inevitably make their way onto websites such as YouTube, where they could reach an untold number of viewers, who may be tempted to create their own battery failure.

Impact

The result of the recalls, headlines, images and videos is that manufacturers are receiving more claims regarding incidents allegedly involving Li-ion batteries than ever before. One insurer for a computer manufacturer has confided that it has seen a 1000 percent increase in the number of claims received concerning notebook computer fires and incidents since the August 2006 Dell recall. In light of the publicity, Internet video clips, and potential to make money, the number of claims and lawsuits concerning these batteries will not decrease anytime soon. Class action attorneys in the United States have been advertising to solicit clients who may have suffered personal injury or property damage as a result of a lithium-ion battery, and are ramping up to file suit at some point. In Canada a class action lawsuit was filed against Dell, which alleges that Dell knew about the overheating and fire hazards of the lithium-ion batteries, yet continued to sell these products without adequate

warnings. In Maryland, a plaintiff sued Dell seeking $750,000, alleging that she received an electrical shock from the lithium-ion battery contained in a notebook computer.

Insurance subrogation claimants, their experts, and their attorneys are becoming more aggressive in attributing fires to products containing lithium-ion batteries. It is understandable why – the media and public perceptions have been slanted to view the batteries as ticking time bombs, plus there is guaranteed to be an insurance policy from which to seek recovery. Claims are presented either directly by the consumer or through subrogation by a property insurer. Most of the claims involve fire/property damage, and some involve alleged personal injury. For good or ill, the perception now exists that because a product contains a Li-ion battery and a fire has occurred, the fire must have been the result of the Li-ion battery. For example, Wilson Elser is handling the investigation of a claim that involves a lithium-ion battery installed in a notebook computer. The uninsured homeowner, relying on a recall, alleges that the computer, in particular the battery, caused the fire. However, the lithium-ion battery installed in the computer was not affected by the recall and was not even provided by the same battery manufacturer as the recalled batteries.

Also, it is expected that the decrease in size of products containing lithium-ion batteries will lead to an increase in the number of claims. This is particularly fitting for notebook computers. Today's notebook computers require a tremendous amount of energy to run multiple programs, surf the Internet, display color graphics, and transmit and receive wireless signals – all of which the consumer typically demands. Therefore, the batteries powering these computers need to contain sufficient energy to support this use, for an extended period of time, while not weighing down the notebook.

Investigation and Defense Strategies

The ubiquitous nature of products containing lithium-ion batteries makes them an easy target for claims. Imagine a house fire occurred and the subrogation claimant's expert has narrowed the area of origin to the desk of a home office. On that desk at the time of the fire was: an ashtray, a notebook computer, a cellular phone, a PDA, a digital camera and a pile of papers. It is more likely than not that the expert will state that one of the devices had a battery failure that caused the fire. The expert will support his conclusion by referring to battery recalls, whether or not the subject product was affected by the recall.

You should immediately begin an investigation upon your receipt of a claim involving a product containing a lithium-ion battery. You should also determine at the outset whether you are dealing with an OEM component or not, irrespective of the nature of the action (i.e., property damage or personal injury); this is hugely important. Open communication with an in-house engineer is vital to this process. In the event that the engineer cannot determine if it is an OEM component by a visual examination or from photographs, arrange to have the component, product and charger X-rayed as soon as possible. Retain a well-qualified and well-respected engineering expert. The retention of attorneys knowledgeable in handling product liability claims is also as important as the retention of an expert.

In the meantime, gather as much information as you can about the product and the claimant/insured. Review records to determine what battery or charger was shipped with the product and match them with the components at issue. Contact the battery's supplier to see if there are any unique manufacturing characteristics of the cell/pack to help establish component identity. Determine how the consumer came into possession of the product or the battery by requesting a copy of the sales receipt or bill of sale. Find out if the consumer ever had the product repaired, and request any repair records. Be mindful of reported prior problems or help center calls the consumer may have made. Also, determine whether the consumer ever used after-market accessories with the product. Most consumers will deny this, but the sales for after-market accessories prove otherwise. If possible, examine the product, or other products possessed by the claimant/insured, for signs of abuse or misuse.

In many of the fire claims involving products containing lithium-ion batteries, the claimant will generally allege that the battery caused the fire. Nonetheless, other components and other potential ignition sources, whether internal to or external from the subject product, must be considered before rushing to judgment. Further, it is possible that another component or element in the product failed and thereafter caused the battery to fail. In notebook computers, there are several heat-producing mechanical and electrical parts and components aside from the battery. Internal to the computer, the motherboard

and processors – in particular, the graphics processor and the central processing unit – produce significant amounts of heat. These items require an exhaust fan on all computers, notebook or desktop. Some computer engineers have advocated locating the battery further away from the CPU and other hot spots in the computer. In fact, in the wake of the Dell/Sony recall, a Sony representative remarked that it was the combination of the impurities in the battery and the engineering of the Dell computers that led to the incidents of fires and overheating. Others have advocated incorporating a thermal device that shuts the computer down when internal temperatures reach a certain level, which some computer manufacturers have incorporated. External to the product, the charger, which is sometimes not provided by the battery supplier/manufacturer, may need to be investigated for either a malfunction or abuse that caused a failure. Lastly, consumer/claimant abuse, misuse or negligence needs to be evaluated. Was the product or battery hit, dropped, thrown, immersed in water, exposed to heat? Was the user a smoker? Did the consumer leave combustibles around the heat-producing item?

Once a claim is made, expect the issue of tender of defense and indemnification to be a sticking point between the product manufacturer and the battery supplier. It is incumbent upon the product manufacturer to place the supplier on notice of the claim, as soon as possible, should the manufacturer elect to tender its defense and indemnification. Conversely, it is incumbent upon the battery supplier to not accept that tender unless the supply agreement provides for such, and until it is proven that the subject battery is its own and that a battery failure caused the incident. Nonetheless, there should be a free flow of information between both sides – not only to resolve the instant claim, but also because it is more likely than not that future claims will be presented. Depending on the business relationship between the product manufacturer and battery supplier, it may be beneficial to develop a plan of action concerning the handling and investigating of claims. From the product manufacturer's side, this would include prompt notice and sharing of information, photographs and records with the battery supplier to confirm product identity. From the battery supplier's side, this would include sharing information concerning unique characteristics of the battery cells and promptly responding to the product manufacturer's request for information.

Conclusion

The rise in alleged lithium and Li-ion battery failures in the past few years is undoubtedly due to a combination of factors: the increase in numbers of batteries in the marketplace; media/Internet accounts of alleged failures; recalls and public perception; higher energy batteries; and new or inexperienced manufacturers trying to get a piece of the pie. While manufacturers continue to research and develop the next new technology, the products of today have become reliant upon rechargeable lithium-ion batteries as power sources. As manufacturers and the CPSC continue to issue recalls, the media, the plaintiff's bar and their experts will continue to implicate these batteries as ignition sources. Given that the number of these claims will only increase before they decrease, it is in the product manufacturer's and battery supplier's best interests to quickly and thoroughly investigate each incident and protect themselves from these claims. Over time, if the manufacturers and suppliers are consistently able to disprove any causal link between the battery and the ensuing fire or injury, claimants will think twice about pursuing these types of claims.

About the Authors

H. Michael O'Brien

H. Michael O'Brien is a Partner in the New York Metropolitan offices of Wilson Elser. Michael's practice is focused on representing manufacturers and marketers of consumer appliances and consumer electronics. He has more than 20 years of experience defending his clients in product liability actions where it has been alleged that their products were responsible for causing fires and the resulting damages and injuries from these fires. He serves as national counsel for product liability for a number of well-known consumer electronics and consumer appliance manufacturers and marketers. Michael serves as a Co-Chair of Wilson Elser's Product Liability Practice Team and its Class Action Practice Group.

Gregg A. Tatarka

Gregg A. Tatarka is an Associate at Wilson Elser's White Plains office. He is a graduate of the Seton Hall University School of Law, *cum laude*, 2005, and the University of Notre Dame, *magna cum laude*, 1998. Prior to joining the firm he worked for the Department of Defense.
