Swiss Re
Corporate Solutions

Slido.com
#TLS2023

Electronics Industry:

Casualty risk trends perspective

24 August 2023

Swiss Re
Corporate Solutions

Slido.com
#TLS2023

Opening

Jack See, Head Malaysia

Slido.com
#TLS2023

Swiss Re
Corporate Solutions

Slido.com
#TLS2023

Electronics industry risk trends from a casualty risk insurance perspective

Eric Hu, Manager of RES Casualty APAC

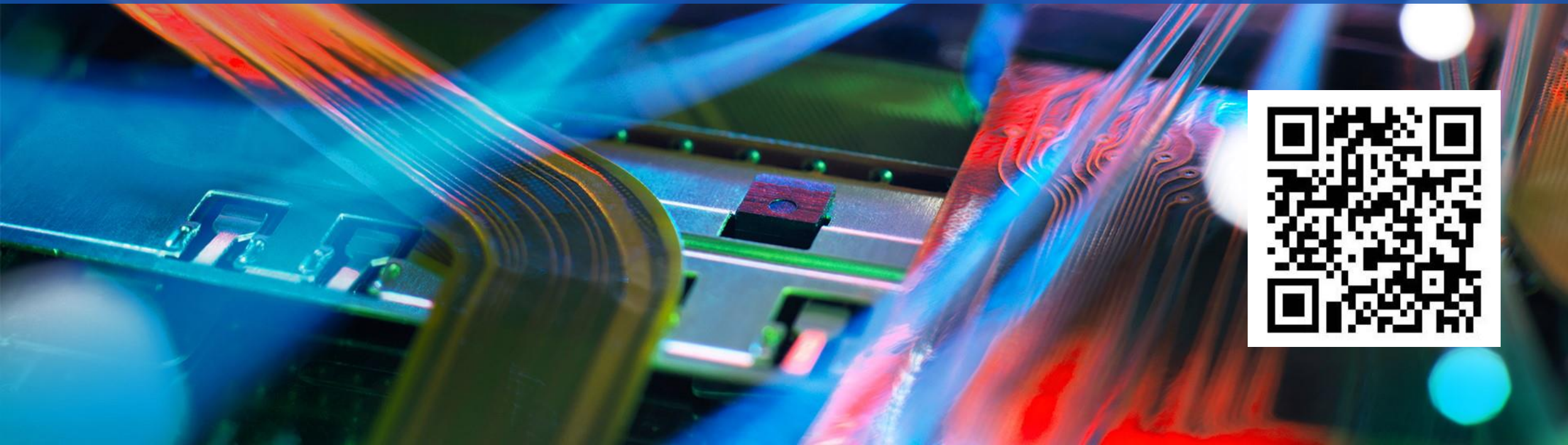


Table of Contents

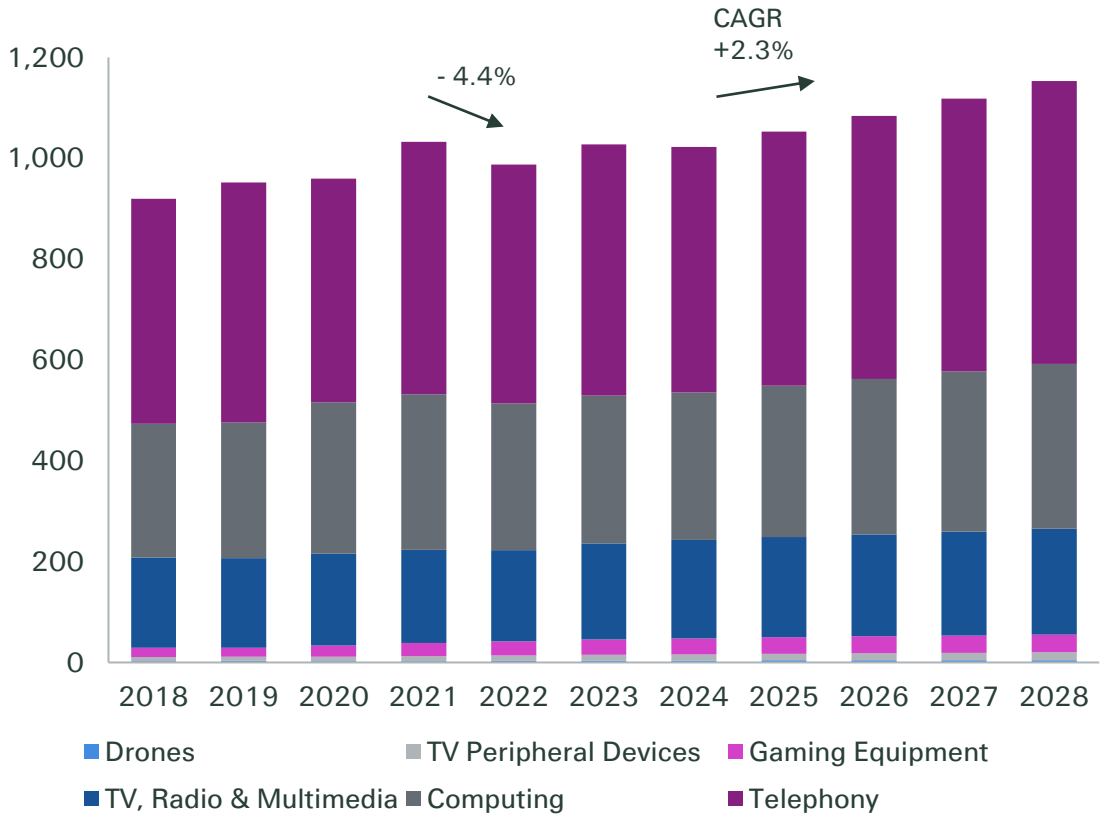
Market Dynamics and Industry Value Chain

01

Swiss Re
Corporate Solutions

Consumer Electronics market is expected to grow by 2.3% over the next few years

Consumer electronics market
in billion USD



Reference: Statista

- Telephony is the largest segment with about 50% share
- Average revenue per capita will grow from USD 130 in 2022 to USD 144 in 2028
- VR and AR striding
- Intensified competition
- Contraction in 2022 and challenges going forward
  - Market saturation of smartphone
  - Rebound in computing devices
  - Economic slowdown
  - Surging inflation rates
  - Decreased consumer spending

The world becomes increasingly digitalized and interconnected

Electronics industry growth area

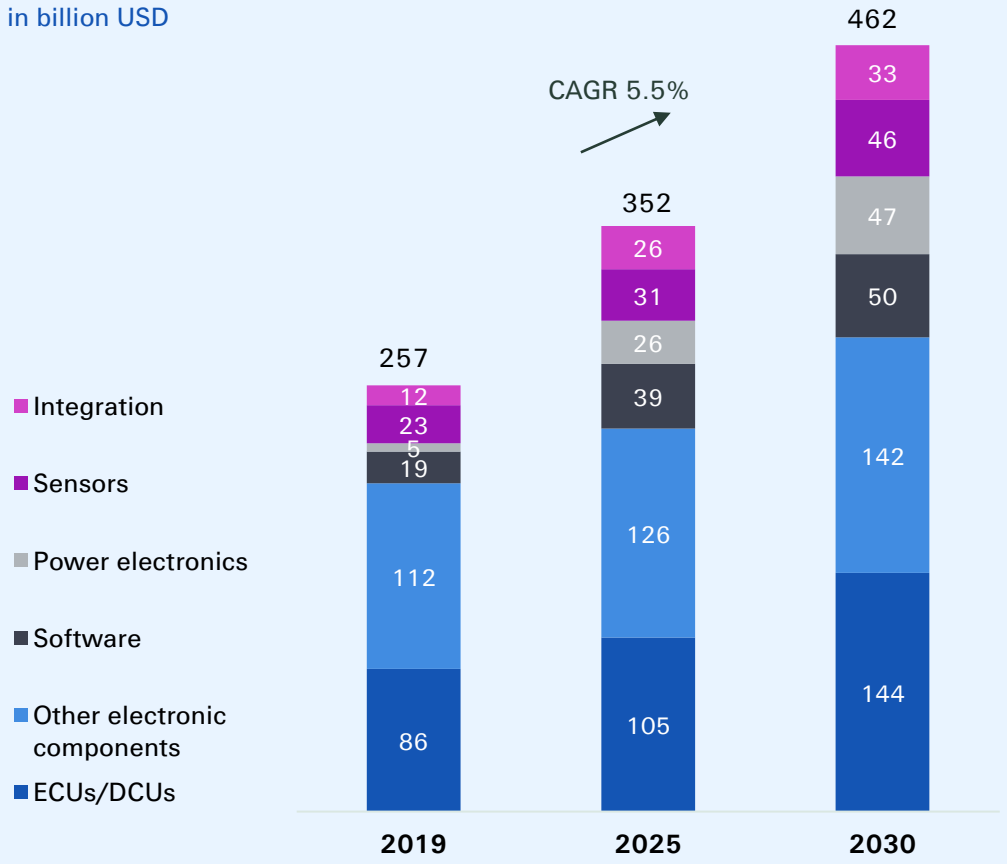
Consumer Electronics	Automotive	Industrial, Telecom & Infrastructure
AR, VR, MR and XR*	Connected Vehicles	IoT, IoS, IoP, IoD **
Wearable	Autonomous Driving	Robotics
Smart Home		AI and data centre

* AR – Augmented Reality, VR – Virtual Reality, MR – Mixed Reality, XR – Extended Reality
** IoT – Internet of Things, IoS – Internet of Services, IoP – Internet of People, IoD – Internet of Data

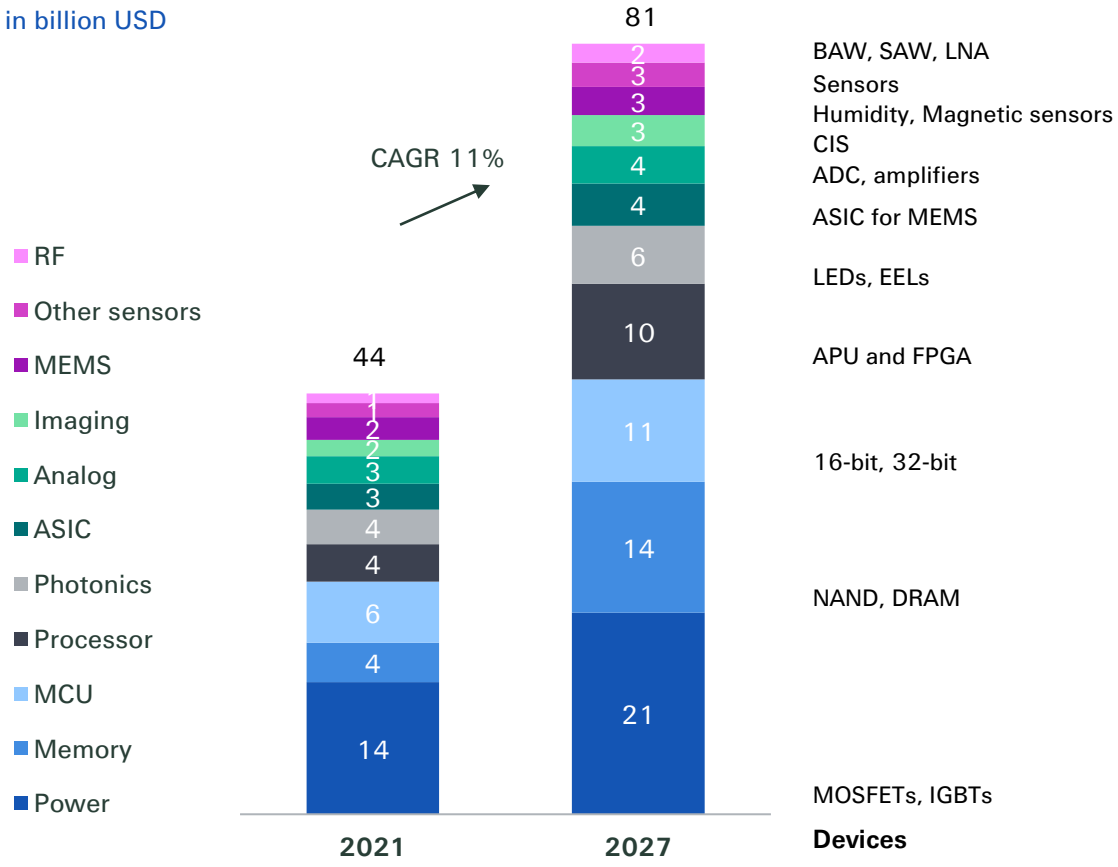
Reference: Wearable technologies. ARM, Apple, Tesla, Forbes

Automotive electronics and software market is growing quickly, automotive semiconductor is one of the key focused areas

Automotive electronics and software market
in billion USD



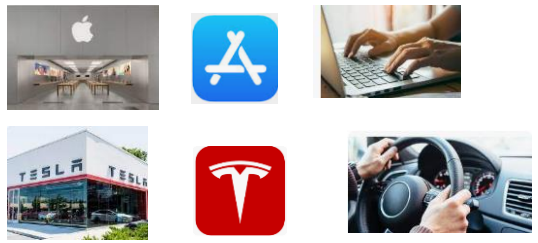
Automotive semiconductor market
in billion USD



Reference: McKinsey, Yole Group

Electronics industry value chain

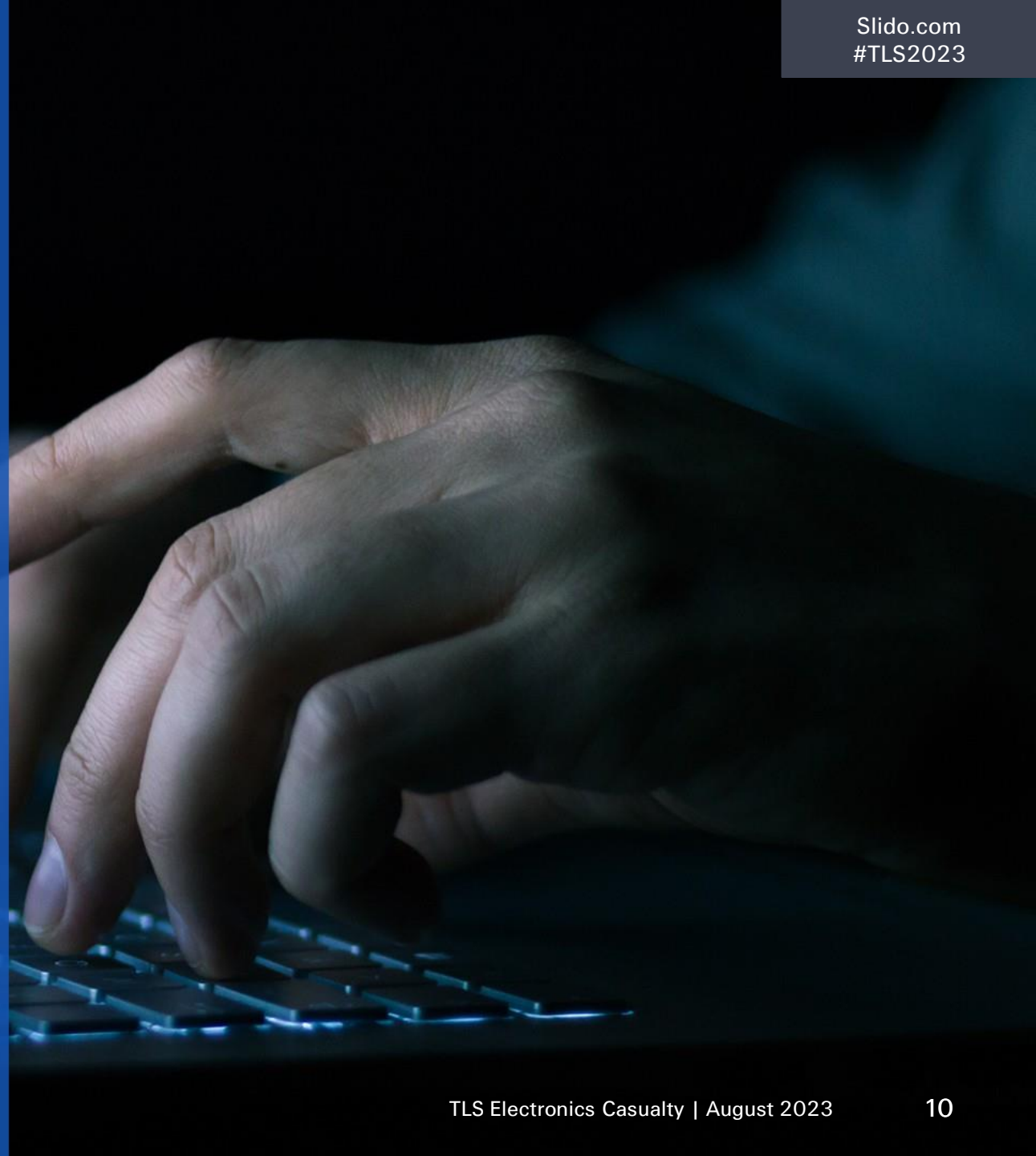
	Manufacturing				Usage		Disposal		
Position	Tier 2/3	Tier 1	OEM/EMS	Logistics	Dealer/ Distributer	Consumer /Customer	Recycling	Waste	
Where	→	→	→	→	→	→	→	→	→
What									
Products & Services	Laminate & CCL	PCBs	PCBA	IGBT	Software	On-line services	Automated functions	Battery recycling	Metal	Combustion
	Relays	Assembly & Packaging	Final assembly	Consumer Electronics	Automotive	International freight	In-land transit	Sales	Repair	Aftersales services	Plastic	Mineral	Landfill
	Wafers	Chips	Sensors	Telecom devices	Air freight								



Reference: Tesla, Apple, RK Recycle

Technology Advancements and Risk Considerations

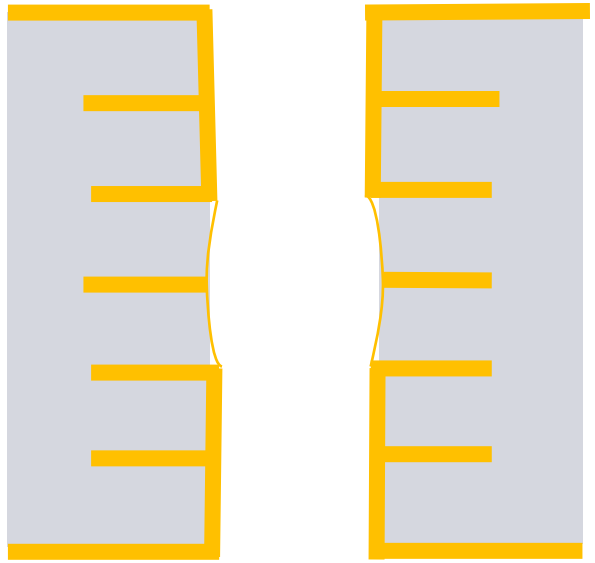
02



Minor manufacturing issue could lead to sizable loss
Casualty loss case

- The insured is a PCB* manufacturer
- PCBAs** were found defective (open circuit) after delivery and partially installation to the final products.
- Initially, there was 1 product failure complaint received among 200+ delivered PCBs and was deemed isolated event.
- Increasing number of defects resulted in-depth investigation and spotted “via hole coating failure” was the cause.
- Defective rate increased to 1% as more products were delivered and spotted with failures.
- All delivered products were recalled eventually.
- It took around 10 months between the first complaint and the confirmation of the corrective action.

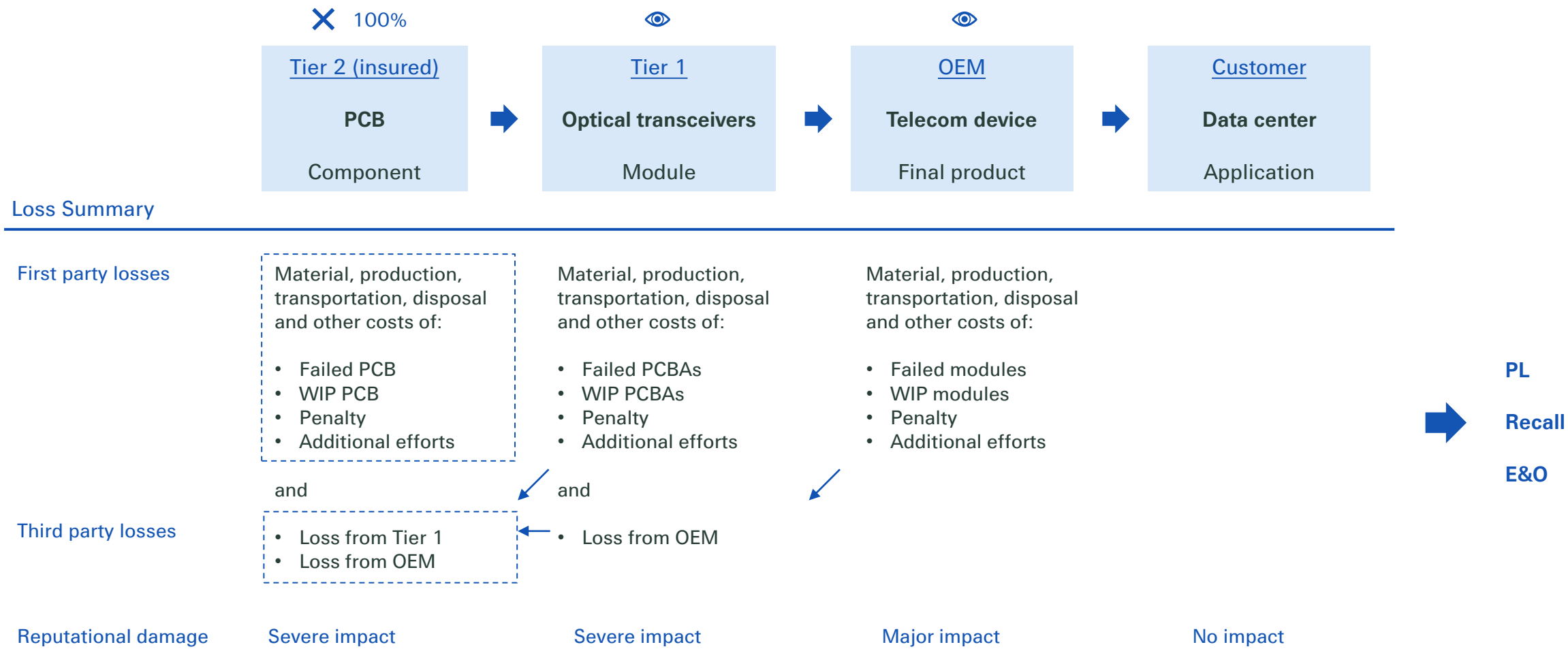
Multi-layer PCB



Defected via hole
Dia. = 0.15mm – 0.20mm

* PCB – Printed Circuit Board, ** PCBA – Printed Circuit Board Assembly

Losses are transferred back to the suppliers, reversing the value creation process
Casualty loss case



What we learned from analysing claims and losses
Typical electronic industry risk drivers

Observations

- Post delivery failures despite testing and inspections
- Losses were triggered despite low PPM*
- NG (No-Good) cases increases overtime
- Loss investigation takes long time
- Controversial investigation results
- New products and new applications
- ...

Risk drivers

- Mixing and combining
- Deep integration level - impaired property
- Very high batch size
- Deterioration takes time - detection latency
- Innovative technology
- Stringent quality requirements
- ...

* PPM – Part Per Million

Risk Trends and Risk Landscape

03

Swiss Re
Corporate Solutions

The risk trends derived from the market dynamics and technology advancement are gradually affecting the electronics industry

Miniaturization. Market demand for smaller electronic products with equal or even better performance.

New products and new applications. Increasing demand on new applications such as EV, AI, AR, 5G.*

Embedded software. Electronics modules and final electronic products are defined by the software.

Wider application of batteries. Batteries are more widely used in broader electronic products.

Supply chain restructure and reshoring.

Risks embedded when implementing advanced technologies. Such as 30um via size, 2um line/space for substrate, thin dielectric fore < 20um, laser drilling with high throughput

New product introduction (NPI) are introducing huge amount of novel risks into every aspects of the operation.

Cyber events and software defects are becoming increasing concerns, especially for electronic products for safety critical use cases.

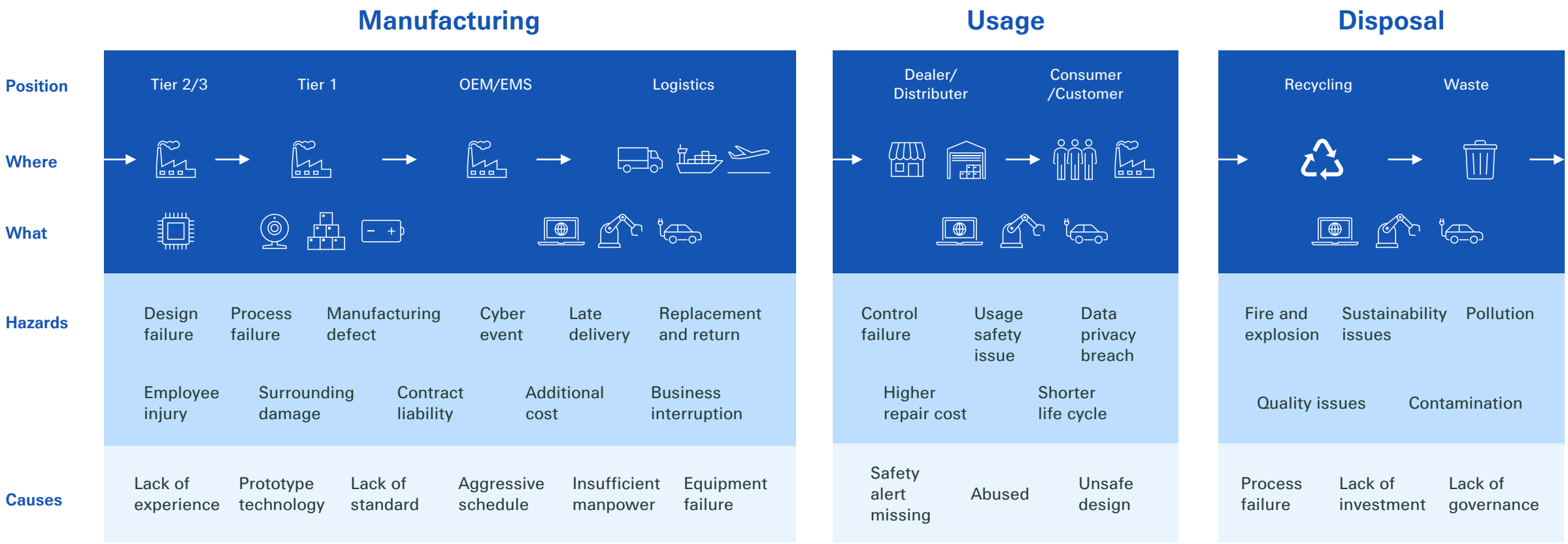
Fire and explosion risk derived from the increasing use of high energy batteries.

Newly established supply relationships could increase the risk of misalignment and errors.

* EV – Electric Vehicle, AI – Artificial Intelligence, AR – Augmented Reality.

Reference: Siemens, Prismark, Swiss Re Institute

Risk landscape: Electronics industry casualty risks along the value chain



Key takeaways
To establish risk mindset centralized management practices

Change
Embrace changes and continuously manage and improve

Imbalance
Avoid mismatch between ambitious targets and capability shortfalls

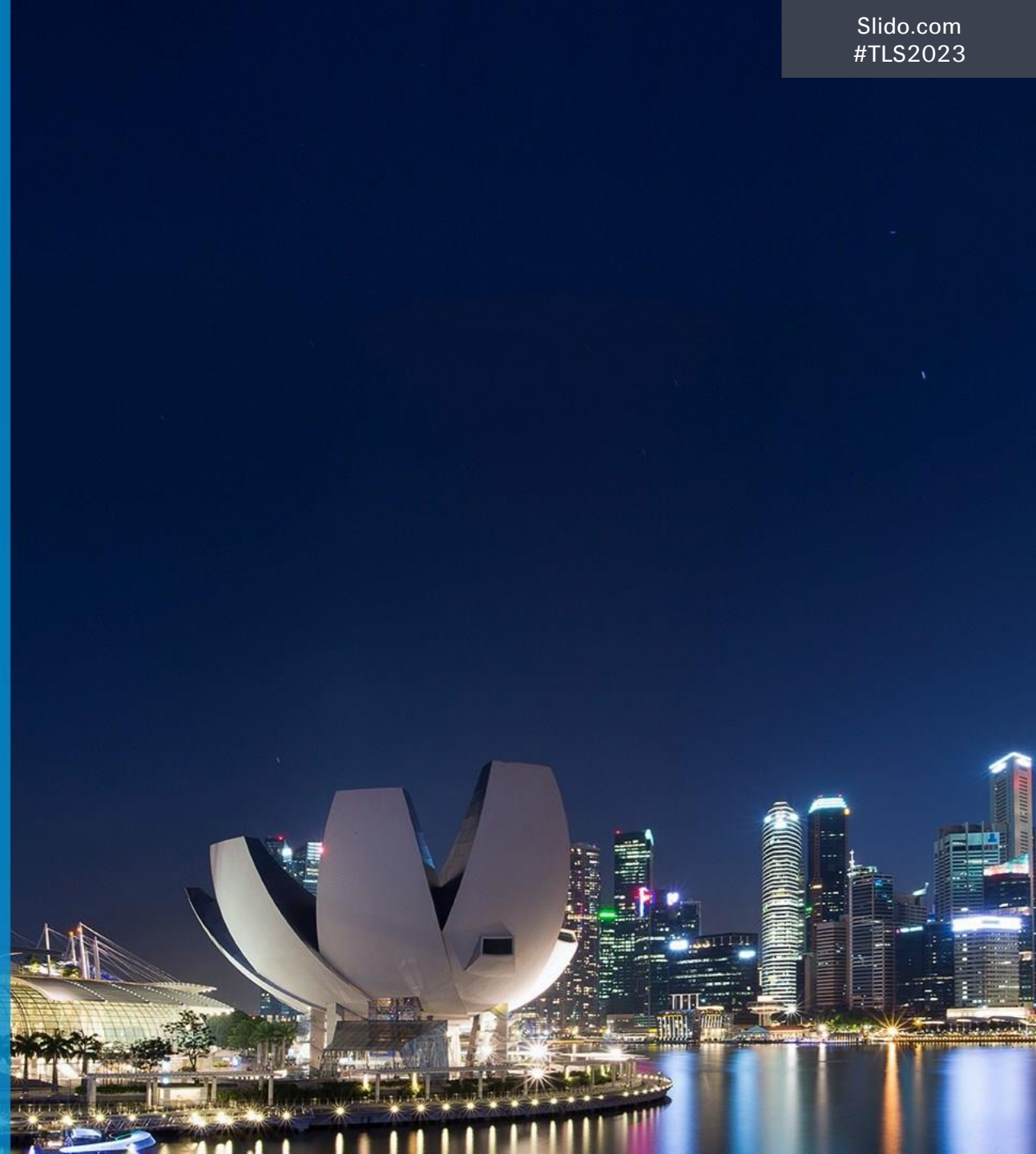
Impact
Enable organizational readiness to mitigate the impacts

Swiss Re
Corporate Solutions

Slido.com
#TLS2023

Electronics- Liability Claims & Recall Trends

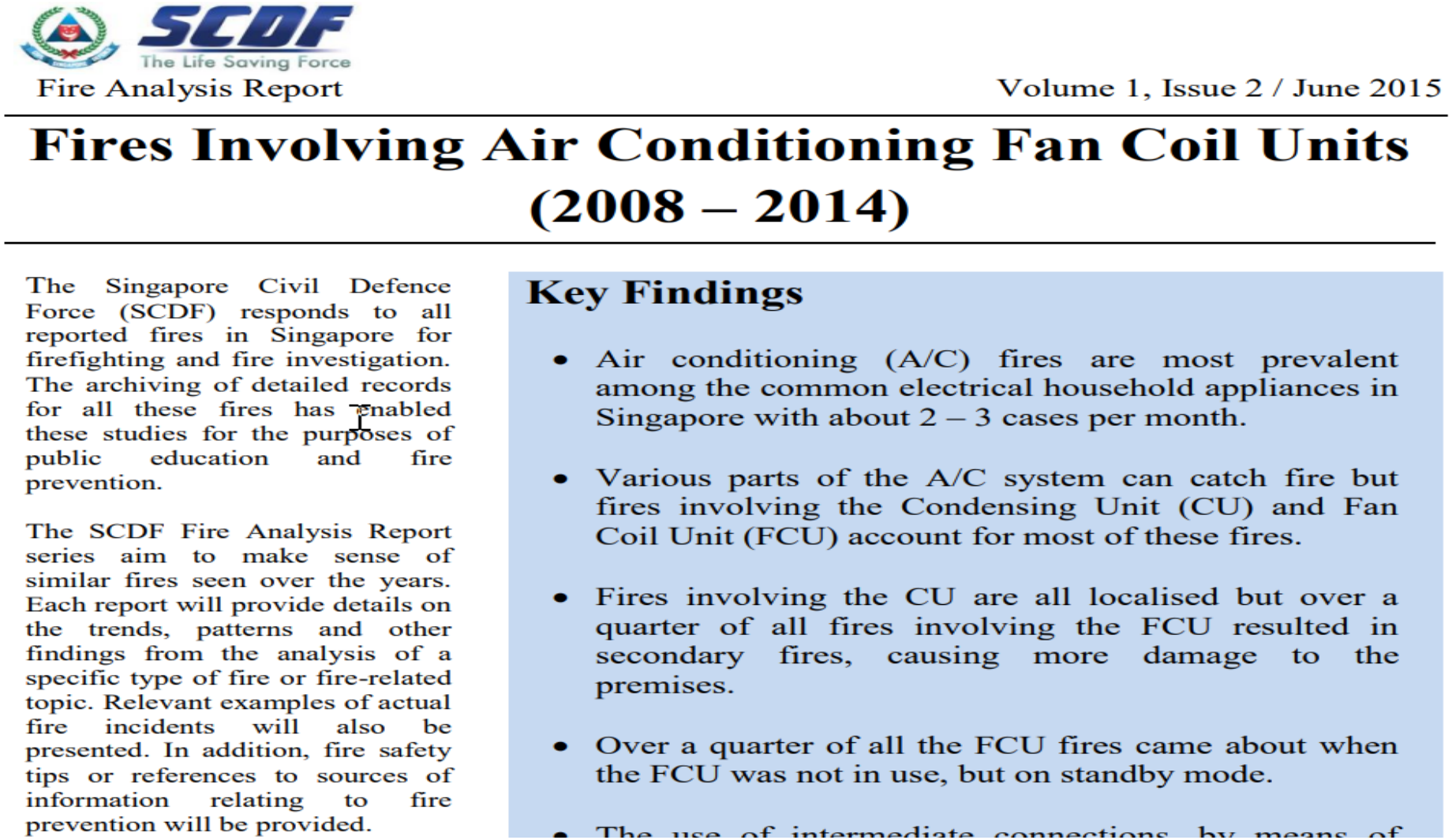
Terence Chew-Lau, Claims Expert



Common Electronic appliances that cause Injury & Damage

- Air-conditioners
- Ovens
- Clothes Dryers
- Toasters and microwave ovens
- Washing Machines
- Dishwashers
- Refrigerators
- Lithium-ion Battery powered personal devices (cell phones, power banks, etc)

Common Electronic appliances that cause Fires



SCDF The Life Saving Force

Fire Analysis Report

Volume 1, Issue 2 / June 2015

Fires Involving Air Conditioning Fan Coil Units (2008 – 2014)

The Singapore Civil Defence Force (SCDF) responds to all reported fires in Singapore for firefighting and fire investigation. The archiving of detailed records for all these fires has enabled these studies for the purposes of public education and fire prevention.

The SCDF Fire Analysis Report series aim to make sense of similar fires seen over the years. Each report will provide details on the trends, patterns and other findings from the analysis of a specific type of fire or fire-related topic. Relevant examples of actual fire incidents will also be presented. In addition, fire safety tips or references to sources of information relating to fire prevention will be provided.

Key Findings

- Air conditioning (A/C) fires are most prevalent among the common electrical household appliances in Singapore with about 2 – 3 cases per month.
- Various parts of the A/C system can catch fire but fires involving the Condensing Unit (CU) and Fan Coil Unit (FCU) account for most of these fires.
- Fires involving the CU are all localised but over a quarter of all fires involving the FCU resulted in secondary fires, causing more damage to the premises.
- Over a quarter of all the FCU fires came about when the FCU was not in use, but on standby mode.
- The use of intermediate connections by means of

[far-issue-2.pdf (scdf.gov.sg)]

Example of Product Liability Claim against Appliance Manufacturer

What will be the outcome if there was conclusive evidence fire was from a design or manufacturing defect?

Air-conditioning

- Insured: Asian air-conditioner manufacturer
- Fire burnt down house in Texas and killed 7-year-old boy. Multiple electrical appliances in vicinity of air-con unit- forensic investigations were inconclusive as to whether air-con unit caused the fire.
- Lawsuit against Insured who disputed their liability.

Award: USD 34,010,000

Settled for USD 7,000,000

Example of Product Liability Claim against Component Manufacturer

Heaters

- Insured: Thermostat manufacturer
- Malfunction of heater in Canada
- 5 months old baby suffered severe heat stroke and permanent brain damage after room heated up significantly.
- Parents sued the sellers, distributors, heater manufacturer and all the component manufacturers in 2018.
- Suit against insured only dropped recently after destructive tests showed insured's thermostat was not in heater.
- Significant Defense Costs incurred.

What Will The Future Hold?
Hacking Issues In The Age Of Internet of Things

- Experts estimate up to 41.6 billion connected devices by 2025 (forecast by International Data Corporation)

Internet of Things and data placement | Edge to Core and the Internet of Things | Dell Technologies Info Hub.

- EU's AI Liability Directive & Revised Product Liability Directive to make manufacturers liable for injuries & damage caused by AI products

Examples of Products susceptible to hacking:

- Cars and Self-driving cars (start, throttle, brakes, steering wheel)
- Digital thermostats
- Smart coffee machines
- Pacemakers

What Will The Future Hold?
Hacking In The Age Of Internet of Things

Smart TVs

- Testers found TVs can be hacked (e.g. Samsung, TCL);
- Vizio fined $2.2 million in 2017 for tracking customers' watching habits and selling info to advertisers;

VIZIO to Pay $2.2 Million to FTC, State of New Jersey to Settle Charges It Collected Viewing Histories on 11 Million Smart Televisions without Users' Consent | Federal Trade Commission

- 'Weeping Angel' program by CIA allowed people to listen in on conversations via Samsung TVs and hack their Wi-Fi network.

Here's How The CIA Allegedly Hacked Samsung Smart TVs -- And How To Protect Yourself (forbes.com)

- Baby monitors
- Security cameras

How Will Product Policies React?

Adjusting the Product Liability Loss

Scenario

- House catches fire and burns down. Tim Jones, suffers severe burns.
- Alleges air-conditioning unit manufactured by Very Cool Ltd, who are insured by ABC Insurance Co was cause of fire.
- Air-con was in vicinity of table lamp and TV, all of which were burnt.
- Tim Jones files suit against retailer and distributor of air-con in U.S. for injuries and property damage.
- Distributor notifies Very Cool Ltd of claim and seek indemnity/coverage.

Adjusting A Product Liability Claim

Adjusting the Product Liability Loss

Generally need to establish the following quickly:

- Cause of loss
  (i.e. was Property damage or injuries caused by the insured electronic product or by other adjacent devices ?)

- Policy coverage
  (is defendant an Insured? loss within Policy period/Retroactive date? Within covered territory? Terms cover the loss? Exclusions apply?)

- Quantum

- Reserve estimation

Adjusting the Product Liability Loss

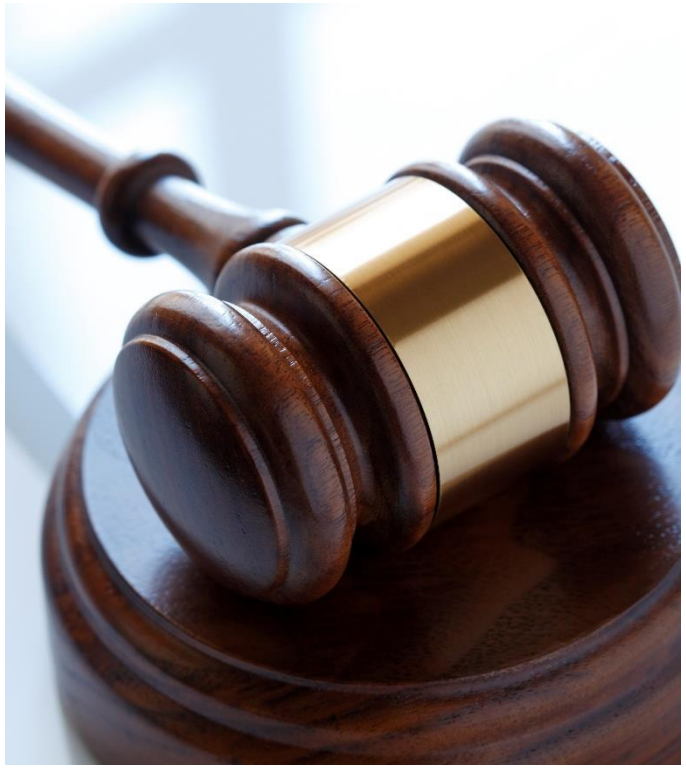
- Milestones
  - Immediate Site Inspection (if Third Party Property damage involved) and Preservation of Evidence
  - Expert Cause Investigation (appointment of Loss adjusters, Forensic scientists etc)
  - Appointment of Defence Lawyer
  - Claims personnel to decide likelihood of successfully defending case in Court, or whether to settle out of Court.
  - Hold meetings with clients to discuss progress & defence strategy.

Adjusting the Product Liability Loss

Some questions that need to be established:

1. Where in the channel of distribution is the Insured (i.e. manufacturer, intermediary, retailer?)
2. How old was the Product at date of accident?
3. What evidence is there to indicate the Product was cause of loss?
4. Were there adequate warnings on the Product?
5. Has there been any similar claims involving this Product and this manufacturer?
6. Where is the venue of the claim? (significant impact on ultimate cost of the claim)

Adjusting the Product Liability Loss



7. Has a law suit been filed? If so, in what court?
8. Details of Plaintiff (age, marital status, dependants, employment etc)
9. Detailed description of injuries, permanent disabilities & medical treatment.
10. Is Insured indemnified, or is he providing indemnity, to any others in the supply chain?

Appointment of Experts

- Crucial to identify appropriate loss adjusters and lawyers who have experience with handling Product Liability claims in the specific State.
- Experts should address recovery/ subrogation prospects, as well as defend Insured.
- Control of adjusting and legal expenses important as such can become disproportionately large.
- Swiss Re is able to assist in identifying and contacting these experts through out the world through our overseas offices and network partners.

Options of Insurer

Insurers may here do 1 of 3 things:-

1. Settle the matter by negotiations from the outset if the claim contains substantial merits against the insured

2. Proceed with filing a defence on behalf of the insured and negotiate a settlement

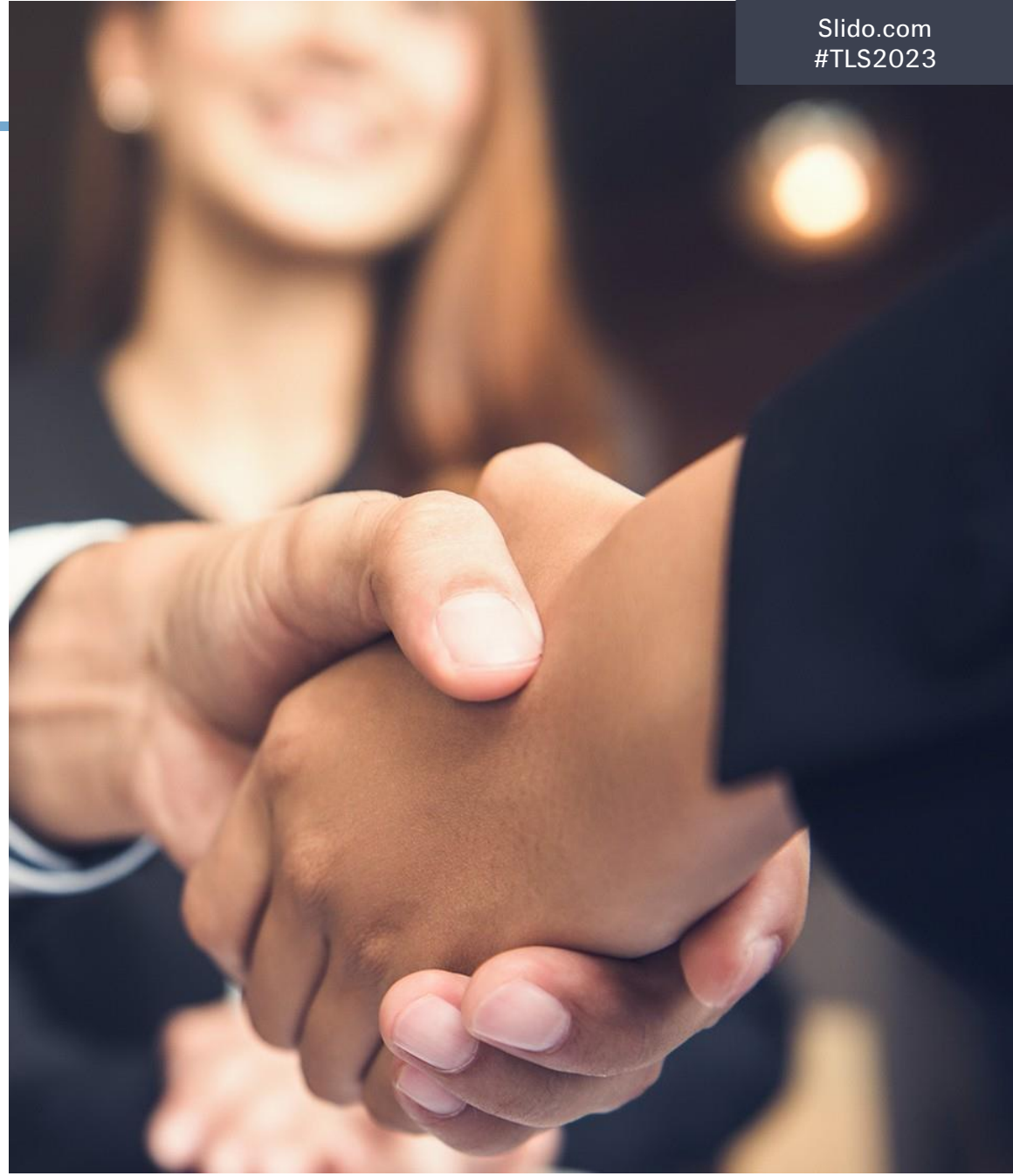
3. Defend the matter to trial

Conclusions

- Defending Product Liability claims in foreign jurisdictions require in-depth local knowledge & expertise and can be very costly.
- Size of bodily injury awards trending upwards and can be huge, especially in the U.S.
- Product liability claims from defective electronic products often lead to Recalls of these products. Recall costs can be large.
- Product Liability, Product Recall & Manufacturers' E&O insurance (covering T/P's pure financial loss) essential if manufacturers are to be adequately protected from severe financial loss.

Joint Solution for your clients in the Electronics sector

- Packaged Solution
  - ✓ CGL / Products Liability with Product Recall and/or Manufacturing E&O
  - ✓ Shared Limit approach
- Benefits
  - ✓ Provide one-stop solution
  - ✓ Avoid grey areas in event of claims
  - ✓ Translate into premium savings
  - ✓ Tailored coverage according to client's needs



Swiss Re
Corporate Solutions

Slido.com
#TLS2023

Q&A

Geoff Yeo, Distribution Manager

Slido.com
#TLS2023

Swiss Re
Corporate Solutions

Thank you!

Feedback Survey

https://swissre.qualtrics.com/jfe/form/SV_eamfIxvFZoNStb8

Contact us

Geoff Yeo
Distribution Manager
geoffery_yeo@swissre.com

Yong Jin Jo
Senior Distribution Manager
yongjin_jo@swissre.com

Follow us

Legal notice

The information and opinions contained in the presentation are provided as at the date of the presentation and may change. Although the information used was taken from reliable sources, Swiss Re does not accept any responsibility for its accuracy or comprehensiveness or its updating. All liability for the accuracy and completeness of the information or for any damage or loss resulting from its use is expressly excluded.

Sources/References/Bibliography

Apple. Vision Pro. https://www.apple.com/apple-vision-pro/

ARM. xR, AR, VR, MR: What's the Difference in Reality? https://www.arm.com/blogs/blueprint/xr-ar-vr-mr-difference

Bob Willis. Printed Circuit Board Failures – Causes and Cares Webinar

Forbes. Tesla Bot: Elon Musk Reveals Humanoid Tesla Robot Which Is Apparently Not A Joke . https://www.forbes.com/sites/johnkoetsier/2021/08/20/tesla-bot-elon-musk-reveals-humanoid-tesla-robot-which-is-apparently-not-a-joke/?sh=14f1582457c3

Roland Berger. Printed circuit boards are rapidly changing. https://www.rolandberger.com/en/Insights/Publications/Printed-circuit-boards-are-rapidly-changing.html

Tesla. Model 3. https://www.tesla.com/en_hk

Tempo. Supply chain FMEA. https://www.tempoautomation.com/blog/pcb-assembly-essentials-part-3-supply-chain-fmea/

Roland Berger. Too close for comfort: How chip-like Printed Circuit Boards are disrupting the industry. https://www.rolandberger.com/en/Insights/Publications/Printed-circuit-boards-are-rapidly-changing.html

Shelford. Top 6 reasons why you need to make your home a smart home . https://shelford.com.au/top-6-reasons-why-you-need-to-make-your-home-a-smart-home/

Statista. Consumer Electronics – Worldwide. https://www.statista.com/outlook/cmo/consumer-electronics/worldwide#sales-channels

Siemens. 5 trends shaping the electronics industry in 2023. https://blogs.sw.siemens.com/valor/2023/01/17/5-trends-electronics-industry-2023/

Wearable technologies. IoT, IoS, IoP, IoD – The key technologies driving industry 40 and beyond. https://wearablestechnologies.com/iot-ios-iop-and-iod/

McKinsey. Outlook on the automotive software and electronics market through 2030. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/mapping-the-automotive-software-and-electronics-landscape-through-2030

Yole Intelligence. Semiconductor Trends in Automotive.

Swiss Re Institute. Sigma No 3/2023.