Market Surveillance
The NZ recipe for Electrical Equipment Safety

Peter Morfee
Principal Technical Advisor

EnergySafety
WorkSafe New Zealand
I am the Principal Technical Advisor within EnergySafety, which is an operating unit of WorkSafe New Zealand.

While WorkSafe is New Zealand’s workplace safety Government Regulatory Agency, EnergySafety is the government agency with responsibility for both public and workplace, Electricity and Gas safety, spanning from generation, through transmission, and distribution to installations and appliance safety.

My role focusses broadly on Electricity safety but today I will focus on the safety of electrical and electronic equipment (EEE).
I see myself as a Regulatory Systems Engineer, and one who has a reputation for unique presentations

In this case I will give you a flavor of New Zealand while I explore how the NZ vision of Market Surveillance is achieved

Hopefully, I will give you cause to question what I say
Market Surveillance

What is market surveillance?

Is there a correct recipe for it?

Who’s role is it?

Or is it a combination of elements that together seek to ensure that safety in our respective jurisdiction stays within societal tolerance?
Like any good cake recipe, both the selection of ingredients and their proportions are important. Surveillance is no different.

Add to this a bit of Risk assessment and the WTO aspirations and we can have a surveillance system that should meet the tastes of our community.

But we must remember that not all recipes will be suitable for other marketplaces.
Tolerance

NZ society exposed to major disasters with more than 7 fatalities

- Major disasters (>7 fatalities)
- Non-natural disaster and accident without known inquiry (?)
- Trendline tolerance (Major disasters)
- Trendline (Non-natural disaster & accident without known inquiry (?)

- Napier earthquake
- Erebus
- Canterbury earthquake
- Tangiwai
- Pike River
- Balantyne’s fire

- $R^2 = 0.5385$
- $R^2 = 0.1389$

Year:
- 1825
- 1850
- 1875
- 1900
- 1925
- 1950
- 1975
- 2000
- 2025

Number of fatalities per disaster:
- 0
- 50
- 100
- 150
- 200
- 250
- 300

The chart illustrates the trend in the number of fatalities per disaster over time for major disasters, with a focus on events with more than 7 fatalities, including notable disasters such as the Napier earthquake, Erebus, and Pike River. The data shows a decrease in fatalities over time, indicated by the trendlines.
The journey begins
New Zealand’s EEE safety regime is risk based, having three regulatory intervention levels.

The regime uses international Standards either directly, or as IEC based, regional (Australia / New Zealand) Standards.

The regime is closely coupled to the regulatory regimes of the Australian States and Territories through an equivalence based mutual recognition arrangement – The Trans-Tasman Mutual Recognition Agreement.
At the core of NZ’s EEE regime is a specially developed semi-quantitative risk assessment tool (Risk Engine).

This tool is used to assist the determination of the premarket regulatory intervention level for each of the common electrical and electronic products used by the NZ community with the highest risk level products requiring third party certification.

This risk assessment tool also guides market surveillance.
While the risk engine uses the classical formula of combining probability and consequence, \((R=\text{P} \times \text{C})\), it is recognized that there is not a linear tolerance for consequence and for probability.

Consequently, we use a graphical portrayal of probability and consequence, plotting them on the two axis’s.

The probability and consequence values are assessed using a list of factors that we have identified as affecting probability and consequence of non-compliance with recognized benchmarks (Standards).
Regulatory design

The purpose of the different regulatory interventions is to bring all products into the same risk level in the marketplace and allows us to determine technical surveillance targets.

This assessment, which applies a pre-market intervention, can also be used interchangeably with post market surveillance.

The mixture of the two controls can be varied as market maturity occurs. We often apply a high surveillance level for new technology products when they are first introduced.
We see market surveillance as being focused on the risks of the products in the market and not strictly on all the individual requirements of the applicable Standards.

The Risk Engine assists us to determine not only the products for surveillance, but also the technical safety aspects that need to be checked thereby reducing the costs of surveillance.
Impact of the size of the NZ market

The New Zealand market is relatively small, with a very open border and a developed technical economy.

New Zealand also has several MRAs including a market-to-market arrangement with Australia.

As a result there is a wide range of imported products often in small quantities making classical surveillance activities difficult, however the arrangement with Australia includes the benefits of full Regulatory Cooperation where their surveillance results and incident investigation information is shared.
Incidents

In NZ, incidents are investigated, however a majority are caused by misuse or involve products well past their service lifetime.

There are several products that are commonly involved in fires, including multi-boxes, where besides misuse, the safety deficiency indicates that the Standard is inadequate.

In this case the surveillance is targeted at the revision of standards.
While NZ has few EEE manufacturers, most of the NZ based manufacturers have testing facilities to aid with quality control, and equipped to test at least the technical requirements more probable to fail compliance.

They also have the knowledge of the areas where manufacturing short cuts return competitive advantages.

NZ manufacturers jealously protect their local market as the NZ market is significant to ensuring their financial success.
Importers

Likewise, many of the major importers also operate their own testing facilities as quality control over their imported products.

This is important to them as the NZ retailers are sensitive to having unsafe products.

This sensitivity is created by EnergySafety’s focus on surveillance and enforcement at retailer level causing the sellers to ensure that the products they are supplied with are compliant.
As a result, many manufacturers and importers are equipped and resourced to carry out surveillance of their competitors' products and are willing to bring their surveillance information to EnergySafety in a form, and credibility, such that it can be immediately used for enforcement purposes.

In one particularly important incident, involving building wiring cable, the involvement of industry itself enabled the cable to be identified and removed before it was placed into service.
From a regulators position it is vital that reports from industry participants are taken seriously and followed up, and that there is identity protection for the parties supplying the surveillance information.
Consumer Surveillance

Surveillance however does not end with the regulator, industry, nor with the investigation of incidents.

EnergySafety also involves consumers by educating them to make informed purchasing decisions, a factor increasingly important with online sales.

If consumers make informed decisions, they are contributing to the outcomes sort through Market Surveillance.
EnergySafety (as the safety regulator for both electricity and gas) conducts safety promotional/educational multi-media campaigns using a cartoon character called Claude.

If you smell gas indoors get everyone out of the house quick smart
Consumer education.

It is critical therefore that consumer education is seen as a part of market surveillance and equally that the factors identified for consumer decisions are also a part of the Regulator's surveillance to ensure that non-compliance is obvious in the marketplace.

For EEE in New Zealand; the unique plug, our supply voltage and the use of English language on markings and instructions are the current focusing factors are requirements that we are very insistent on.
These are criteria that indicate that products were never intended for our market.

In fact, our Regulations deem that products fitted with the wrong plugs and incorrect voltage markings are immediately legally unsafe.

These safety provisions are also seen as a part of the Market Surveillance requirements of our regulations.
Climatic conditions

New Zealand is fortunate to be located on the planet in a location that does not have extensive freezing conditions (except of course at our Antarctic base where we share a border with the United States).

Nor do we have the tropical temperatures that occur in locations closer to the equator.

Therefore the special climatic variations of the IEC standards, while desirable, are not critical.
If an appliance has been manufactured with an NZ plug, is marked with the correct voltage, and the instructions are in English, the probability of compliance, and hence safety, can be expected to be tolerable.

*There will always be a residual risk from suppliers who are prepared to produce unsafe products.*
Small scale importers

To deal with small scale importers we propose to establish an arrangement with our customs department to inform us of the importers of small numbers of equipment that is assessed as being of high risk so that we can follow them up using our enforcement processes and tools before the products are sold.

Over time we expect to be operating a combined “AI” based customs interaction using both our regulatory functions to improve compliance of products in our marketplace.
New Zealand recognizes the compliance cost of requiring certification for electrical equipment and because certification is required for high-risk products, as part of our market surveillance, we audit the certification bodies that we recognize to ensure that they are adding adequate benefits to the Regulatory Regime proportional to their costs.
Certification inadequacies

As a result of significant inadequacies identified in the last few years, EnergySafety has reviewed the rules associated with certification and is at the last stage of implementing revised rules which include requiring the certification body to closely review the test reports used as the basis of issuing certificates to ensure that NZ’s Regulatory and Standards requirements have been verified.

The principal certification failures resulted from testing and certification not including the specific requirements for the New Zealand market, including our supply voltage and the correct voltage markings.

These failures included EVSE and RCDs, products where compliance is critical.
Market surveillance is a multifaceted, shared activity.
In closing let me leave you with this slide suggested by MS PowerPoint:

Mars maybe,
but
Not New Zealand

Thank you