

Power Solutions for Critical Infrastructure

Maximum Power availability through innovative technology

POWER PROTECTION AND DISTRIBUTION



A new dimension to switchboard protection from NHP and Terasaki

3C is an integrated overheating protection system which monitors, alarms and communicates abnormal temperatures of mission critical switchgear and inaccessible busbar zones.



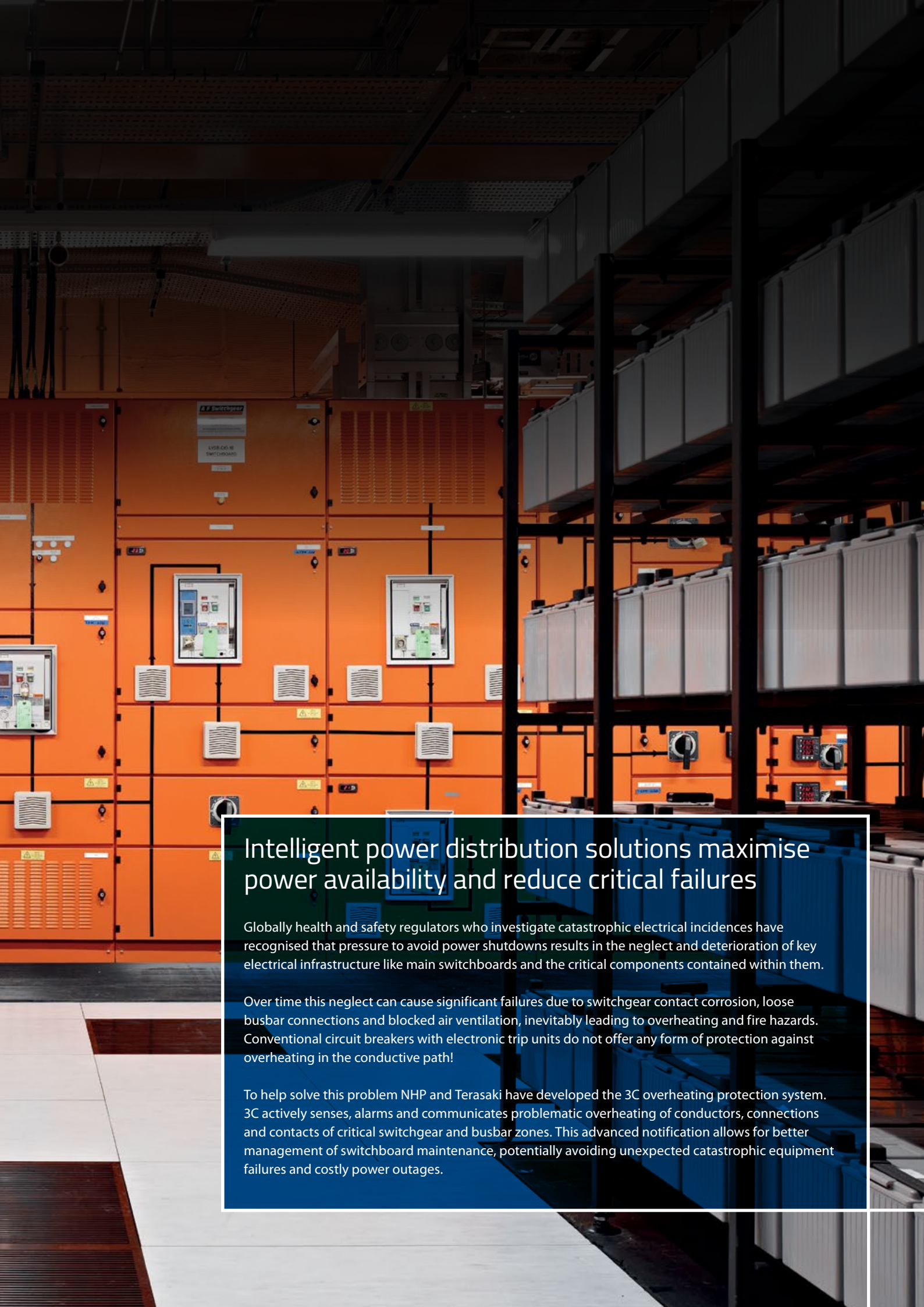
Incoming
circuits



Outgoing
circuits



Busbar
zones



Intelligent power distribution solutions maximise power availability and reduce critical failures

Globally health and safety regulators who investigate catastrophic electrical incidences have recognised that pressure to avoid power shutdowns results in the neglect and deterioration of key electrical infrastructure like main switchboards and the critical components contained within them.

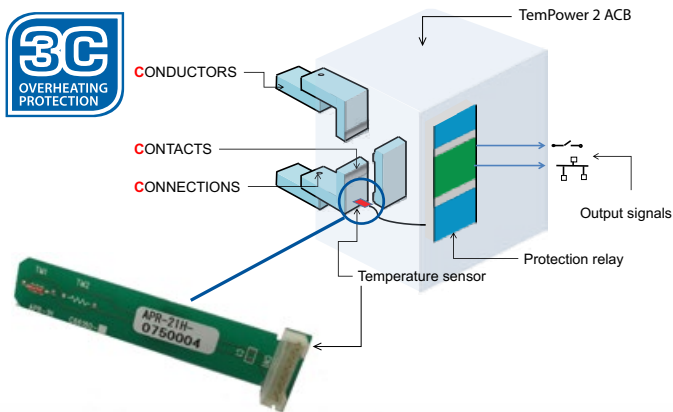
Over time this neglect can cause significant failures due to switchgear contact corrosion, loose busbar connections and blocked air ventilation, inevitably leading to overheating and fire hazards. Conventional circuit breakers with electronic trip units do not offer any form of protection against overheating in the conductive path!

To help solve this problem NHP and Terasaki have developed the 3C overheating protection system. 3C actively senses, alarms and communicates problematic overheating of conductors, connections and contacts of critical switchgear and busbar zones. This advanced notification allows for better management of switchboard maintenance, potentially avoiding unexpected catastrophic equipment failures and costly power outages.



Critical Incoming Switchgear

3C overheating protection is fully integrated into Terasaki TemPower 2 Air Circuit breakers (ACBs). Abnormal temperatures are detected by the ACBs protection trip unit via the thermocouple sensors that are imbedded near the main contact set. Upon an overheating detection, the trip unit will generate an 'Overheat' (OH) alarm on the local LCD, close a volt-free output relay contact and deliver an alarm message to the communications network. The ACB can be configured to 'alarm' or 'alarm and trip' when an abnormal overheating is detected.*



Busbar zones and Outgoing circuit switchgear

Using external 3C monitoring modules, other devices and areas of the switchboard, such as busbar zones and outgoing circuit switchgear like Moulded Case Circuit Breakers (MCCBs), can also be protected from overheating.

These DIN rail mounted modules are typically installed within a switchboard control cubical and are connected directly to the busbar or switchgear terminals by a non-conductive fibre optic probe that is terminated with a special lug. Each module can accept up to six fibre optic sensors, with real time temperature and alarm data available over the communication network.

System Visibility

The 3C overheating protection system can be fully integrated into any modern intelligent power distribution network running a BMS or SCADA system, providing real time updates when abnormal overheating occurs. To further assist with the visibility of your switchboards performance, NHP has created a 'Health Dashboard'.

The Health Dashboard is a cloud based solution that provides valuable feedback on the serviceability of critical components within the switchboard such as circuit breakers.

Using the Health Dashboard, parameters such as circuit breaker temperature status and trip history are immediately visible via the cloud. This allows users to better understand the current health status of the device, as well as predict the future serviceability of the asset.**

** Integrated Overheating protection is an option, not a standard function.*

*** Health Dashboard to be launched in 2018
Contact NHP for more information.*



SWITCHGEAR HEALTH DASHBOARD

OPTIONAL NHP MONITORING



The benefits of the NHP Switchgear Health Dashboard:

- Connect your assets to smart systems for real-time decision making.
- NHP Switchgear Health Dashboard will give you 24/7 condition monitoring.
- The built-in and programmed alarms will alert you if there are any changes to conditions of your assets.
- Cloud based Health Dashboard, you can always be connected and monitor the performance of your assets and equipment wherever you are.
- Real-time condition assessment enables more accurate predictive and preventative maintenance, resulting in a reduction of downtime.
- Effective condition monitoring using a combined service approach can maximise your asset life, minimising operating cost.
- Real-time insight gives you a better predictability which allows you to tell when it is time to update your assets.
- Optional NHP Service Support: The NHP Service Team can monitor the condition of your assets. If the condition of the asset changes then NHP will contact you and recommend and potentially perform appropriate measures.

Example 3C overheating protection system implementation

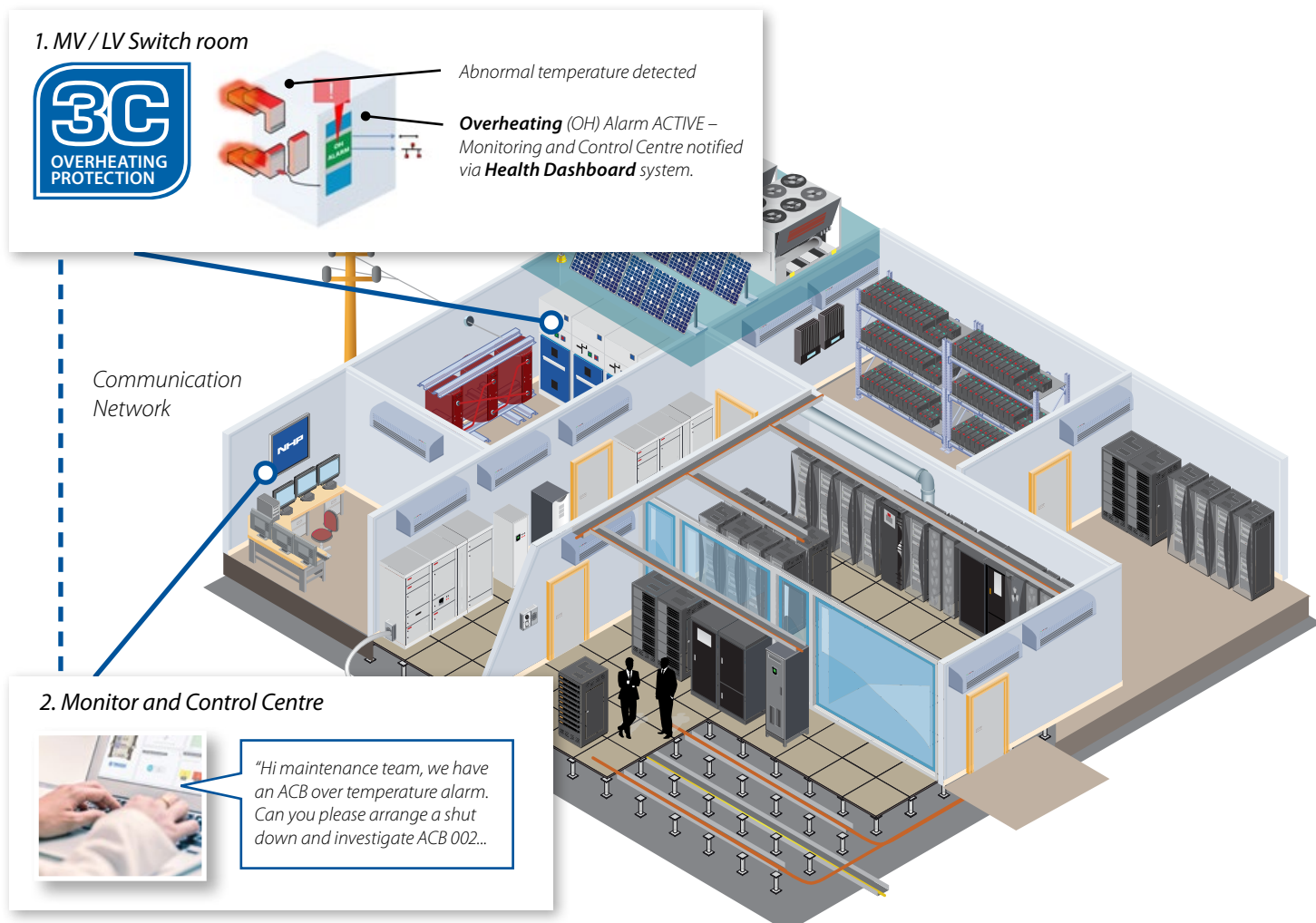
Imagine we have a tier 4 data centre that provides 99.995% availability per year to its customers. To maintain such a high level of uptime / availability, the data centre's power and cooling design requires layers of redundancy and furthermore the ability to monitor the integrity of critical infrastructure. Any unplanned downtime will bring serious financial consequences and dissatisfied customers. In this example the focus will be on the MV/LV switchroom (1) and the Monitor and Control Centre (2) (see below).

Situation:

The low voltage switchboard contains Terasaki TemPower 2 ACBs with integrated 3C overheating protection and data communication. The Monitoring and Control Centre is using the NHP Health Dashboard to monitor and report on mission critical 'intelligent devices'.

Due to a 'maintenance issue' the forced cooling system in the switchroom starts to blow dust particles into the LV switchboard. Some of these contaminants eventually make their way inside one of the LV ACBs internal contact system. Over time the electrical continuity of this ACBs contact path reduces due to the contamination and an abnormal contact overheating occurs.

Fortunately the ACBs 3C overheating protection detects the abnormal temperature within the contact set and activates the alarm (both relay contact and via the data communications network). In this case the ACB's protection trip unit was configured by the site engineer to 'alarm only' (i.e. no trip, just notification) upon abnormal overheating, avoiding the stoppage of critical processes.



NHP Power Hub

The NHP Power Hub is a purpose built, specialist demonstration and training facility located at the NHP head office in Melbourne Victoria. The Power Hub showcases NHP's full power distribution portfolio, from medium voltage to low voltage solutions, including NHP's new generation 3 Concept panelboards.

The high quality medium to low voltage solutions on display are fully interactive and are fitted out to replicate a typical site installation. These displays have advanced features that facilitate hands on demonstration, not only delivering specialist knowledge and training, but instilling product confidence for those who visit the facility.

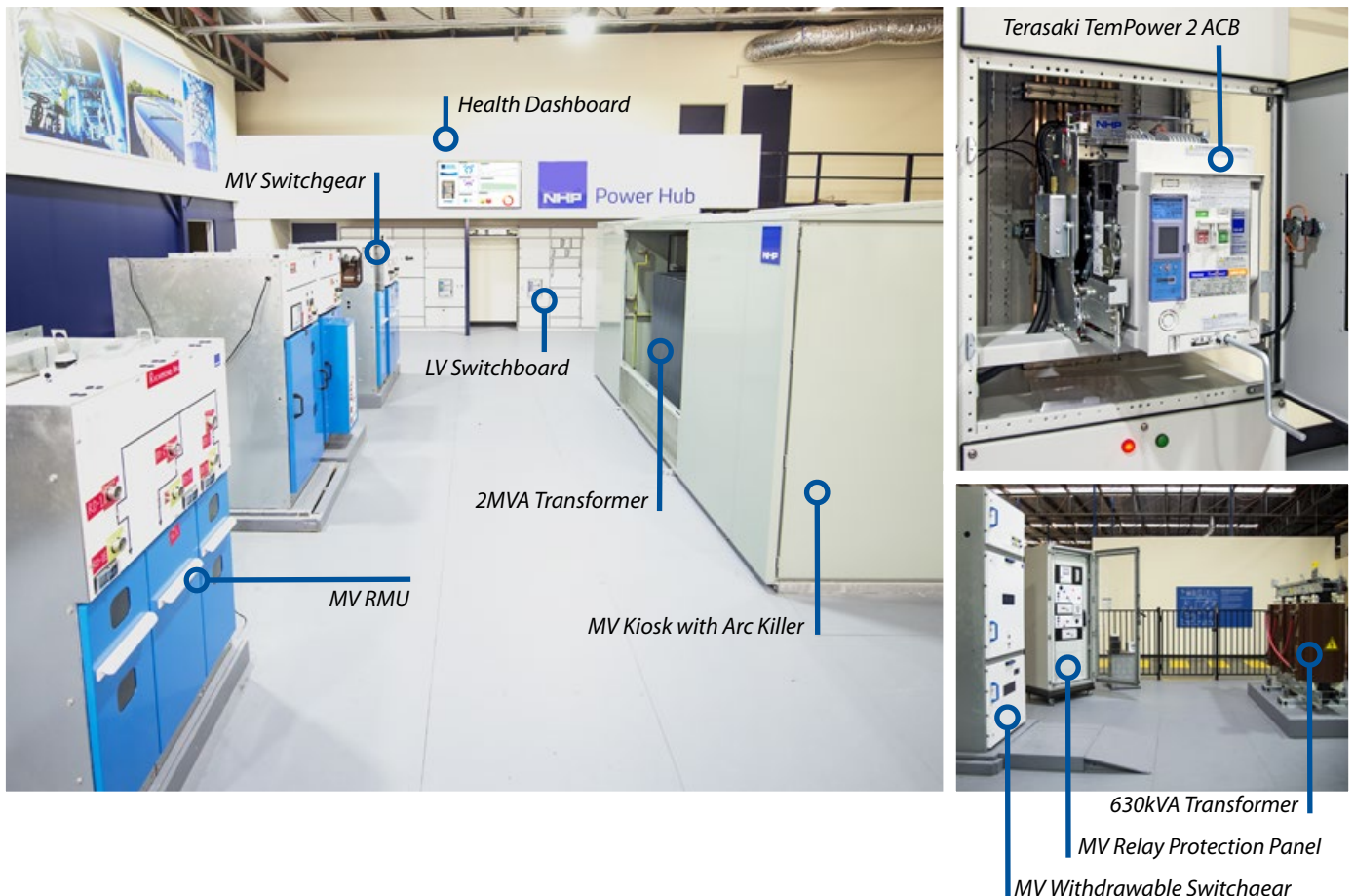
Specialist products on display include a full range of medium voltage equipment including DF2 de-mountable switchgear with a variety of functional panels, withdrawable switchgear, ring main units, oil immersed and cast resin transformers, Agile protection relays and a 2MVA kiosk substation.

Exclusive to NHP's medium voltage solutions is the DF2+ air insulated modular type switchgear which features a built-in arc quenching system called 'Arc Killer' which can extinguish an arc in less than 50ms.

Furthermore NHP's low voltage arc flash mitigation solution 'Arc Logix' is also on display giving visitors a realistic simulated arc flash experience, highlighting the benefits such technology solutions can deliver.

In addition to the medium voltage range, NHP are proud to display a type tested CUBIC modular switchboard which has been fully furnished with Terasaki circuit breakers and Socomec loadbreak and transfer switches. This CUBIC switchboard display also allows users to observe the 3C overheating protection system in operation, with real time monitoring displayed on the cloud based 'Health Dashboard'.

To experience a variety of practical demonstrations and learning activities in the safe and controlled environment please call 1300 NHP NHP or contact your NHP sales representative to arrange a tour of the PowerHub.



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