

Notice to Suppliers



Lesson from power electronic testing failure resulting in near miss

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For the attention of Heads of Engineering

Scope/Applicability:

This NTS applies to RRSL suppliers producing power electronics.

Dear Supply Partner,

Introduction:

A power electronic equipment cubicle was being tested prior to delivery. Due to programme demands the cubicle was built before equipment verification & validation (V&V) testing had been completed and before line replaceable units had been developed. As design assurance testing and V&V Testing had not been done, additional testing was included in the production test specification of the cubicle. The additional testing involved energising the equipment, which included charging stored energy components without covers fitted to the cubicle. The equipment incorporated electronic switches (IGBTs) connected to the output of the stored energy but the control circuitry was not connected, as this was a line replaceable unit. To prevent the electronic switches (IGBTs) from conducting and releasing the stored energy unintentionally, shorting links were applied between the control signals (gate and the emitter).

During testing the shorting link became detached from the IGBT gate and emitter, which resulted in the IGBT turning on and shorting out the stored energy. This caused the IGBT module to explode with parts of the module being expelled from the cubicle across the workshop.

Nobody was hurt during the incident but operators near to the cubicle report ringing in their ears. The vendor has completed an 8D investigation and has updated the production test schedule, standard operating procedures are being reviewed to ensure future test setups are safe.

Programme demands meant the vendor introduced additional tests to mitigate the lack of verification and validation testing, due to the early stage of the development programme. The supplier routinely conducts testing on electrical equipment and has risk assessments and standard operating procedures in place. However, in this case the risk mitigation of shorting the component gate drives proved inadequate.

Action Required:

This NTS is for information, but the key lessons learnt is that:
When conducting electrical testing, ensure the equipment is only energised, when suitable robust risk mitigation has been implemented considering the possibilities of unlikely events occurring.

NTS Category:

Safety

Authorised by:

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