

Measured Occupational Noise Exposures of Volunteers and Residents Exposed to the Newcastle 500

Dear Ms Tranter

Sound exposure levels measured during the Newcastle 500 motor racing event confirmed expected high and damaging noise exposures to tens of thousands of people, both working, attending and bystanders. These exposure levels were what is considered extreme – $L_{Aeq,8\text{-hours}}$ greater than 105 dB or 75 times the allowable daily noise exposure, and L_{Cpeak} levels of up to 150 dB, 10 dB above the anytime exposure limit of 140 dB. Changes to the way information is presented to the public and employees about the noise associated with these events is recommended to be implemented prior to the next similar event.

You may recall I provided correspondence to SafeWork NSW outlining my long-held concerns that sound level exposures would be excessive and potentially harmful during the Newcastle 500 motor racing event. You were kind enough to respond to me on 27th September, confirming your position that SafeWork NSW was satisfied that the noise model prepared by Supercars consultant Jacobs Australia Pty Ltd *“uses appropriate inputs and modelling methodology to reasonably estimate noise levels from the racing event”*.

I initially met with Mr Robins and Ms Tate from your office on 12th May 2017. I outlined the potential implications of the expected noise exposure from the event for PCBU's as they seek to comply with managing noise, to develop a suitable code of practice and to prevent hearing loss at work. I also undertook to understand the role and jurisdiction of SafeWork NSW to manage and mitigate noise (and other) exposure for their employees and others.

In that meeting, I advised SafeWork NSW of the predicted sound exposure levels track-side, and the equivalent allowable doses that these levels equated to under the Act. Mr Robins' response clarified the position of SafeWork, stating *“However, as it currently stands SafeWork NSW is satisfied that Supercars Australia are addressing their WHS responsibilities, so far as is reasonably practicable.”*

At that time, I was not aware that any information or advice had been provided by Supercars or others such as NCC to the residents, to the community, to PCBU's in the affected area, or to other potentially exposed parties. Supercars released their Noise Management Plan to the public on 8th September 2017. This contained no direct or specific information to residents or PCBU's to allow them to make an informed choice regarding their health and safety or that of employees or visitors during the event. Instead the approach from Supercars was to amortise the predicted exposure levels over a 10 hour period, rather than to provide clear and prescriptive advice on how 'loud' the event would be during racing and what action should be taken to ensure in-ear sound exposure levels would be below the levels of concern, based either on best practice, or on legislated allowable exposure levels.

Part of my preparatory work prior to the event was to understand the potential exposure and risks to PCBU's and the community. This involved preparation of a detailed predictive computer noise model in March 2017. The methodology and predicted results from this report were provided to your office on 13th May. This was similar in methodology and structure to the Jacobs Australia model that Supercars has refused to release to the public. During the Newcastle 500 motor racing event weekend, I undertook to validate my predictive computer noise model by conducting attended noise measurements at many general as well as at key 'control' or modelled locations. These were taken using a calibrated type 1 Integrating Sound Level Meter at 94 locations around the circuit, around greater Newcastle East and at specific locations around greater Newcastle where the motor race was either audible, or where it may affect PCBU's. For example, this included the local Police Command at Church St and Newcastle Grammar School's Newcastle East campus. I also used two calibrated Type 1 sound recording and logging sound level meters, one inside and one outside a premises at 4 Scott St, which was chosen to represent a typical track-side residence. Attended measurements were repeated at many identical locations during different racing events of the weekend to understand the range of exposures actually occurring with the different vehicles racing.

The attended and logged measurements confirmed that my track-side predictive modelling results in particular were both accurate and representative of worst-case sound exposure levels for those exposed immediately adjacent to the circuit. Sound pressure levels track-side typically ranged from 102 to 105 dB $L_{Aeq\ 3\text{-minutes}}$ (within 2m from the majority of concrete barriers) around the circuit, and were typically 102 to 109 dB $L_{Aeq\ 3\text{-minutes}}$ along Watt St (the maximum recorded sound level was 125 dBA) and the maximum L_{Cpeak} level recorded (along Parnell Place within the residents precinct) was 150 dBC. Along Parnell Place I recorded 9 exceedences in a single minute of the 140 L_{Cpeak} maximum at any time criteria. This location was the worst-case measured for L_{Cpeak} exceedences and was adjacent to where cars changed gear under full power. I would welcome the opportunity to share this information with SafeWork, NSW Health, the EPA, Destination NSW and Supercars.

Under the Workplace OH&S Act legislation, and assuming a conservative and continuous 105 dBL_{Aeq} sound level at trackside locations during racing, this equates to an exposure allowable to the unprotected ear of just 4.7 minutes. On Saturday racing events lasted approximately 5 hours and 50 minutes, and approximately 5 hours and 25 minutes on Sunday. This equates to

approximately 74 times the allowable dose on each day of racing. If an individual is exposed to 109 dBL_{Aeq} continuously, these 'allowable exposure periods' reduce to 1.9 minutes of unprotected exposure and increase to 187 times the allowable daily exposure dose. Many people engaged under PCBU's were even closer to the circuit than I could safely measure and would be exposed to even higher sound levels, please refer to the photo in figure 1 of two circuit volunteers, neither of whom were wearing any protection when observed for more than 30 continuous minutes. Significant scientific literature suggests that any exposure to sound pressure levels greater than 110 dBA for any period in excess of a few seconds can cause permanent damage to hearing.

Observational studies were also undertaken on Saturday of the general public and those under the jurisdiction of PCBU's to gain a broad understanding of who was wearing hearing protection during the main V8 race. Observations revealed that of 1855 people directly observed within 2 metres of the circuit (about 3% of those attending), the following people were observed **without** any hearing protection.

- 91% of adults,
- 75% of children,
- 87% of babies, and,
- 70% of workers.

A Newcastle Herald article stated 190,000 attended the event, quoting 56,000 on Friday, 69,000 on Saturday and 66,000 on Sunday. Based on a proportional ratio of the observational study undertaken, indicates that as many as 61,800 individuals on Saturday were exposed to harmful levels of noise for an extended period of time. It can be assumed that many of the same individuals would attend for all three days, further increasing the risk of permanent hearing loss. These results are both alarming and extremely concerning. Addressing those engaged by PCBU's only, although many were voluntary attendees, they mostly would have had no knowledge of the potential for hearing loss or other physical symptoms that such extended high-level noise exposure would cause because Supercars or other agencies did and do not provide such advice to them.

I would therefore request a meeting with yourself and others as you may recommend within SafeWork NSW and NSW Health, to determine an appropriate course of action to mitigate this risk where possible for future motor racing events, both in Newcastle and eventually Australia-wide. My intent is to see a legislation change (and/or Code of Practice) whereby all tickets sold to events known to produce sound levels that qualify as being immediately harmful to the health of either attending patrons or those engaged under a PCBU, contain a clear Health Warning disclaimer such as: *"prolonged exposure without adequate hearing protection to sound levels during this event are likely to cause permanent hearing damage"*. Currently, Supercars states only the following; *'motorsports events are, by nature, noisy events'*. It is not unreasonable that this proposed change of legislation could be expanded to other similarly noisy events, such as drag cars, stock cars, Indy cars, formula 1, power boats etc. I would also strive to enforce ticket vendors to provide a more robust lanyard or other suitable ticket packaging that includes as a minimum, appropriate SLC80 / NRR rated Class 5 ear plugs. With ear muffs offered to babies and toddlers for whom ear plugs cannot be fitted.

In considering the evidence of noise exposure levels monitored during the Newcastle 500 event, it has become immediately apparent that the event is a significant public health issue that can be made safer for all parties, with minimal impact on the event delivery partners or commercially invested parties. This education process and transition could occur as per previous examples including seat belts, bicycle helmets, smoking in public buildings and vehicles and the wearing of motor bike helmets, all of which were initially unpopular and are now embraced. I have no doubt that this will in time be seen as being progressive and responsible, and will be seen to further reinforce current protective SafeWork legislation.

I look forward to your response.

Regards



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Figure 1: unprotected volunteers, track side, Nobby's Road, continuous exposure, > 112 dBL_{Aeq} during racing