

Case study

Working with NASA to create safer ways of working



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personal exposure monitoring

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jets, and rockets,
NASA Armstrong
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quietest place on
the planet.



On the list of organisations that are
incredibly data-driven, well-connected,
and safety-focussed, NASA (more specifically,
the National Aeronautics and Space
Administration) is towards the top.

NASA doesn't require much of an introduction, but outside of the agency's more famous (and interstellar) endeavours, there's a whole host of programmes and missions, ranging from climate to robotics, and many of them require specialised health and safety programmes.

The Armstrong Flight Research Centre ('NASA Armstrong') is NASA's primary centre for high-risk, atmospheric flight research and test projects.

NASA Armstrong operates out of Edwards Air Force Base, a desert outpost drenched in aviation history. In fact, the U.S. Air Force claims that more first flights and recorded flights have been made at Edwards than anywhere else.

An average day at NASA Armstrong could see engineers testing aircraft propulsion systems, technicians working with experimental prototypes, and pilots flying everything from light aircraft to high-speed jets and rocket-powered aeroplanes.

Said otherwise: Between the propulsion systems, jets, and rockets, NASA Armstrong isn't exactly the quietest place on the planet.



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How **Smart Alert** uncovered a small but **important issue** at NASA Armstrong

Noise Smart worked with the Safety Specialist at NASA Armstrong. The team using Smart Alert works with a variety of aircraft at Edwards AFB, including the F/A-18 'Hornet' aircraft, which is a mission support aircraft that's used for research support, routine flight training, and pilot proficiency.

Notably, the aircraft is powered by two turbofan engines, each producing 17,700 pounds (8028.58 kilograms) of thrust. According to the National Center for Physical Acoustics, the Hornet produces a staggering 118 decibels of noise. For anyone nearby, that's an equivalent amount of noise to sitting front-row at a rock concert.

Originally, the Safety Specialist wanted to use Smart Alert to identify which members of his team did not need to be included in his hearing conservation programme. But it quickly became clear that Smart Alert was useful to him and his team in more ways than one: Over the course of using Smart Alert, he learned that several technicians were being exposed to potentially dangerous levels of noise, despite using hearing protection.

Standard Operating Procedure with regards to hearing protection for the team is to use dual-protection; ear plugs with ear muffs (ear protectors) fitted over the top of the ear plugs. During the trial, Smart Alert replaced the team's standard ear plugs, which were worn underneath their ear muffs. And while all team members were diligent about wearing the required kit, the data collected by Smart Alert revealed that some technicians were making a small but

consequential error that meant they were exposed to potentially dangerous levels of noise. Fortunately, this error was also entirely addressable.

Certain team members, it turned out, were prematurely lifting their over-ear protection (ear muffs) while they were still in close proximity to potentially dangerous levels of sound.

Otherwise undetectable without the data collected by Smart Alert, this small error has since been resolved, and the team is now operating more safely with regards to hearing protection.





...but perhaps more importantly than discovering the source of the **potentially dangerous exposure**, was the conversations that Smart Alert created between the technicians and the safety team.





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Using **Smart Alert** to drive important conversations with workers

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Before using Smart Alert, the technician team had never truly understood the level of safety their hearing protection was providing on an individual and near-daily basis. They understood that the jets were loud, and they diligently wore their ear protectors rated for that level of noise and duration, but beyond these basics, the team – like many teams across most industries and sectors – hadn't considered how to understand or quantify the effects of personal habits and practices on an employee's hearing when working in a noisy environment in any great detail.

As a result, Smart Alert helped identify employees who would use hearing protection for long durations of noise but would protect only one ear or neither ear during very short noisy events. Another employee didn't consider an aircraft tug they drove to be very loud and the Smart Alert System alerted the employees to use hearing protection, which they then did. These types of events allowed the NASA Safety Specialist to bring up these observations with employees to train them how to respond to future similar events to protect their hearing at a greater level.

Some technicians had questions about the accuracy and reliability of the data collected by Smart Alert when it was first introduced. These questions were welcomed, and alongside safety experts and the team from Smart Alert, the Safety Specialist took the time to dig into the data

with the technicians, ultimately discovering that the best way to address their concerns was to slightly rework how the data was presented, which was displayed in time-weighted averages for each hour of the day.

Smart Alert defaults to an hourly breakdown of data. But in certain environments, more detail is required to well and truly show exactly how much noise workers are exposed to. In the case of NASA Armstrong, simply changing the breakdown from hours to fifteen-minute periods enabled the technicians to see a more complete picture of their noise environment.

Ultimately, the discourse that the technician's questions created laid the foundation for a deeper understanding of their risk environment with regards to noise, and helped everyone to better understand the value of personal, continuous noise monitoring technology.

At NASA Armstrong, the value of Smart Alert was clear: The team was able to clearly see just how much noise they were exposed to, and exactly when it was occurring. Armed with this detailed information, they were able to take a small but effective course-correcting action, and better protect themselves from exposure to potentially dangerous levels of noise.

To see what insights Smart Alert can unlock for your team, simply get in touch.