

# Noise at Work

A case study for use in teaching in Engineering Ethics

## Abstract

This scenario examines the issues surrounding health & safety in the workplace in relation to noise pollution.

## Teaching Format

2 hour session, small group discussions, presentations.

## Practicalities

This case study is aimed at students who have been taught some ethics before.

## Learning Outcomes

By the end of this session students will understand that:

- Employers have a legal duty of care to consider the health risks that their employees are exposed to
- Employees have a duty of care and responsibility for their own health
- Health surveillance can identify loss of hazard control

## Contents

|        |                                     |
|--------|-------------------------------------|
| Page 2 | Scenario part 1                     |
| Page 4 | Scenario part 2                     |
| Page 5 | Tutor Notes                         |
| Page 8 | Student Handout                     |
| Page 9 | Further Reading & Reference Details |

## Relevant Ethical Concepts & Issues

- Responsibility
- Safety
- Duty of Care

More information about these concepts and issues can be found in the 'Glossary for Engineers' document

## Partners in producing this resource

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## Noise at Work-Part 1

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Nick Rafferty works for Wallcote Brothers, a small engineering firm that produces components for washing machines and other domestic appliances. Nick has been with the company 5 years and after completing his induction programme (6 week rotations in each of the company's departments) settles in their design division. He is a popular member of staff and combines a very sharp mind and an ability to solve problems with a relaxed and easygoing manner, which makes him popular with employees from all levels of the firm. This includes the 'shop floor team', with whom he occasionally shares an after-work pint.

Nick has recently been promoted to Team Leader of Design. Whilst he still reports to Henry Jarvis the Head of Design, Nick has the responsibility for managing a group of 20 employees comprising part of the shop floor team that manufactures washing machine drums. Nick's promotion initially made things a bit frosty with some his new team members as he changed from being their friend to being their supervisor at work. However, Nick has a natural management style which soon appeases any worries that any of the team had about the power going to his head.

Nick is called into Henry's office one day where Henry explains that all shop floor employees at Wallcote Brothers must undergo their regular audiometric surveillance. Most of Wallcote's employees work on a noisy factory floor. Health and Safety laws require that, among other things, companies must implement health surveillance programmes as a duty of care where their employees are exposed to health risks such as loud noise on a prolonged or regular basis.

EarsRUs, a private occupational health service, has been brought in to deliver the surveillance and Nick must inform his team that they are expected to undergo a hearing test. Nick announces in the team briefing the next morning that EarsRUs will be visiting the following week. He explains that the employees' hearing only will be monitored, and that the purpose of this is to ascertain whether Wallcote needs to take any further measures to protect its employees' health.

EarsRUs come in to the factory and conduct the tests. After these are complete they report their findings to Wallcote's Human Resources (HR) department. EarRUs are not at liberty to disclose confidential clinical information about the health of particular individuals which they gain as a result of administering the tests but they do update each employee's health record, stating whether they are fit or unfit for work. All of Nick's team are declared as fit for work. Although patient confidentiality means that Wallcote cannot access any particular employee's test results without that employee's written permission, they are entitled to see grouped anonymized results. This data identifies how many employees' hearing abilities fall within a particular range. Wallcote request such information after every health surveillance check, and do so on this occasion as a matter of routine.

On receipt of the information, the HR department compare this year's results to those from previous years. There is a small staff turnover at Wallcote, with around 85% of the workforce having 6 or more years of service. It is noticed that there is a significant proportion of staff whose hearing has deteriorated over the years, which indicates that there is a worrying trend developing. While all employees were declared fit for work, if the hearing loss trend continues, this may result in more serious long-term problems arising.

| Hearing range | Category 1 | Category 2 | Category 3 | Category 4* | Total | Unilateral Hearing Loss |
|---------------|------------|------------|------------|-------------|-------|-------------------------|
| 1997          | 30         | 9          | 1          | 0           | 40    | 0                       |
| 1998          | 30         | 9          | 1          | 0           | 40    | 0                       |
| 1999          | 29         | 10         | 1          | 0           | 40    | 0                       |
| 2000          | 30         | 8          | 2          | 0           | 40    | 0                       |
| 2001          | 30         | 8          | 2          | 0           | 40    | 0                       |
| 2002          | 28         | 9          | 3          | 0           | 40    | 0                       |
| 2003          | 28         | 9          | 3          | 0           | 40    | 0                       |
| 2004          | 27         | 8          | 4          | 1           | 40    | 0                       |
| 2005          | 26         | 8          | 4          | 2           | 40    | 0                       |
| 2006          | 27         | 6          | 3          | 4           | 40    | 0                       |

**Fig 1: Table showing results of group anonymised data** (\*category 4 denotes worse hearing loss than category 3.)

Whilst the statistical arrangement of the data means that it is impossible to say for sure that the hearing of particular individuals has definitely deteriorated, the trend does look worrying particularly the increase in category 4 which indicates rapid hearing loss in 4 employees.

The HR team cascade the report to the Senior Management Team (SMT) and the production floor team leaders. The talk amongst members of SMT is that immediate action must be taken and they should consider implementing many changes, which could cost the company a substantial sum of money.

Nick receives a copy of the results from HR and feels distinctly uncomfortable. He knows that his team of 20 workers rarely use the safety equipment that they currently have. He is, of course, partly responsible for this; as their supervisor he should have enforced the wearing of earplugs and earmuffs. However, his predecessor allowed the team to work without them as they found hearing protection inconvenient and uncomfortable to wear and Nick didn't want to start throwing his weight around just after he had been promoted, especially since he was already friendly with most of the team. It is possible that the members of his team, all of whom have worked for Wallcote for over 10 years, form a significant proportion of those workers whose hearing has deteriorated. Nick not only feels guilty that his negligence may have led to hearing damage in some members of his team, but realises that if the board are unaware of the lax attitude of staff towards the use of hearing protection then they may spend money unnecessarily, on sophisticated equipment which is not required.

- **What should Nick do?**

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## Noise at Work- Part 2

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Nick decides to come clean and tells Henry that team members in his department generally failed to wear their hearing protection. Although Nick is concerned that he will be perceived to be negligent in his duties he tells Henry that since being promoted he has concentrated on team building and he has not made waves by trying to change that long-standing custom and practice immediately. He now regrets this in light of the results from EarsRUs. He says that he will immediately brief his team to wear their hearing protection or face disciplinary action. Nick suggests however that it would be worthwhile before any money is spent to review the noise risk assessment and noise survey to enable the board to make the correct decisions regarding eliminating or reducing the employees' exposure to noise.

Henry, as a member of SMT, is not pleased to have been informed that employees were not wearing the hearing protection supplied. However, he was not altogether surprised as he was aware that a relaxed attitude existed regarding the wearing of hearing protection. He thanked Nick for his honesty and informed him that he must in future make Health and Safety a priority, but he recognised that Nick had only been a team leader for a short period. Henry approved of Nick's suggestion to commission a noise survey, especially as the legislation regarding noise exposure had recently changed and the level of noise that employees should be exposed to have been lowered. He stated that this would be raised the next SMT meeting

Henry reported to the SMT that there was a long-standing low level of compliance in the wearing of earmuffs and earplugs on Wallcote's shop floor. Henry also advised them that Nick had recommended commissioning a noise survey of the production area.

EarsRUs undertook a noise survey on behalf of Wallcote and the report identified that the washing machine drum area had a noise level above the upper action level at 85 dBA and several areas at or above the lower action level (80 dBA). Health & Safety legislation (in particular the Management of Health & Safety at Work Regulations 1999 and the Health & Safety at Work Act 1974) required Wallcote to take further action.

Options available to the SMT include:

- (a) Enforcing the wearing of the current earplugs and earmuffs as they are just adequate for the current noise levels on the production floor and all the employees were passed fit for work
- (b) Implementing some 'medium term' safety measures - for example issue each member of staff with state of the art earmuffs and bringing in external trainers to implement advanced health and safety programmes as this may encourage compliance. Estimated cost is £200 per employee.
- (c) Implementing extensive measures by replacing some of the older noisier machinery (which will already be approaching the end of its serviceable life) and having all of the remaining machinery 'damped'. This works out at a total of £45,000, around £1000 per employee.

- **What should Wallcote do? Why should they do this?**

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## Tutor Notes

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The tutor takes a facilitator role directing questions where necessary to generate discussion, allowing students to voice their own opinions and encouraging students to justify their answers. To begin the class, give each student part 1 of the scenario and give them time to **read the text. (5 minutes or less for this section)**

Next **split the students into groups** of 4-6 and get them to discuss the question. (These are ideal numbers but larger groups are workable. There should really be no more than five groups in a class and larger group sizes are preferable to greater numbers of groups so expand group sizes if necessary). Encourage students to move chairs or themselves around where possible so that group members can hear each other and so that the different groups are sufficiently distinct from one another. It is often useful to split up groups of friends and put students with people with whom they would not normally converse. While this might make the students awkward to begin with, it helps them to focus on the task and usually ensures that a broad range of opinions are represented within each group making the discussion livelier and more involved. **(10-15 minutes)**

After there has been some discussion bring the group together for a **group discussion**. Ask a member of each group to briefly summarise their answer to the question. The class discussion can begin by focusing on a point at which groups disagreed and ask them to comment further - why they gave that answer, why they think that the other groups are wrong etc. Discussion should flow but below are the main points that should be covered **(10-15 minutes)**:

**What should Nick do?** Nick really only has two options; either he can say nothing or he can come clean

- **Say nothing:** Because of the anonymised data, Nick cannot be certain that any of his team have damaged hearing. Admitting to Henry that he does not enforce the wearing of safety equipment can only harm Nick's reputation at work. He could start getting his team to wear their protection from now on and this would comply with the law and protect his team members from any further damage. Moreover, the members of his team also have a responsibility to wear their hearing protection. Nick has failed to enforce the use of earmuffs but the situation is not entirely his responsibility. Henry, however, may not see it this way so silence may be the best way to protect himself. However, Wallcote may be about to spend money on unnecessary safety equipment. The SMT will assume that safety equipment is currently being used and that the deterioration in employees' hearing indicates that more elaborate and expensive equipment is required.
- **Come clean:** As a supervisor Nick is in a position of responsibility and expected by Wallcote to behave professionally. This will entail being honest about how things are going on the shop floor, including at those times when honesty means Nick admitting some faults on his part. Because the company needs to plan its safety policy, Nick should inform them that employees rarely use their hearing protection. This information will allow the SMT to implement safety measures which are appropriate for the risks present and will have the effect of protecting the health of the employees more effectively in the long run. By doing this Nick will also demonstrate to Henry that he is honest. This will foster an atmosphere of trust and openness between them which will help their working relationship with benefit to Wallcote and possibly to Nick's future career prospects.

There is a strong ethical case for Nick coming clean but you could discuss how doing the right thing is often difficult - it may involve putting one's own interests below those of others, for example. In this case, Nick runs the risk of being disciplined for not implementing safety policies properly but this risk may be outweighed by concerns about saving Wallcote unnecessary expenditure and caring for the health of his co-workers.

After the discussion allow the students a **10-15 minute break**

**Part 2** of the case study continues the scenario based on the fact that Nick decides to come clean and admit to Henry that he has been lax in his duties. Give the students part 2 and allow them to read it **(5 minutes)**

Get the students back into their groups and tell each group that their next task is to **prepare a report** to deliver to the class outlining which option they think Wallcote ought to take. The reports need not be very formal and should only take 5 minutes or so to deliver. If you wish you can allocate each group an option to argue for but you may wish to allow the groups to choose for themselves. Tell them that you will be expecting them to argue their cases well: listing a number of reasons why they think Wallcote should take the option that they favour. The handout attached can be given to students to give them some ideas of how to organise their reports. Resources should also be made available to help the students research. Access to the internet, as well as to books and articles, is ideal. In the Further Reading section of this document, resources appropriate to each option are suggested, and it might be useful to make up a resource pack to hand out to each of the groups. **(30 minutes)**

Bring the students back into a large group, moving chairs where necessary, and ask each group to **report back to the class** as a whole. Give each group 3-5 minutes in which to deliver their report before moving on to the next group. There should be minimal discussion at this point - if any students interrupt tell them to record their thoughts on paper for the time being, and that there will be time to discuss this after each group has presented. Record what each group says on a board or flipchart - or get the group to do this part themselves - so that you can refer back to this in the discussion and conclusion. **(15 minutes for the reports).**

After the reports have been delivered there is time for some group discussion. Again, open discussion to the floor. A good place to begin is by asking students which report they thought was best. This can then lead on to discussing the deeper ethical issues of the case. Summarised below are the main issues associated with each of the options. These considerations can be broadly categorised as economic/practical, legal and ethical; however, there is some crossover between categories: some economic considerations will also be ethical considerations; some legal considerations will also be ethical considerations. You should allow **15-20 minutes** for discussion.

### **What should Wallcote do? Why should they do this?**

#### **(a) No change but enforcing the wearing of current hearing protection**

**Economic/practical:** This option will save Wallcote the most money; at least in the short-term. However, practically speaking it may be difficult to enforce the wearing of PPE (personal protective equipment) especially given the prevailing work culture not to. If workers do not use the safety equipment then this could lead to lawsuits in the long term from employees whose hearing has been damaged which would be highly detrimental to the company's finances.\*

**Legal:** According to Noise at Work regulations, once the noise level exceeds 80 dB then employers must provide hearing protection. The wearing of this protection must be enforced once the noise level exceeds 85dB. Wallcote have given their employees earplugs and earmuffs, and would just need to enforce this in areas of high noise level to comply with the law. The Health & Safety at Work Act also makes it the employer's duty to do 'as much as is reasonably practicable' to reduce risks in the workplace. The 'as much as is reasonably practicable' clause makes it difficult to judge whether Wallcote comply with this law or not. Arguably doing the bare minimum does not constitute 'as much as is reasonably practicable'; however, Wallcote are unlikely to be prosecuted for this.

**Ethical:** Employers have a duty of care to their employees and this goes beyond simply paying them for the work that they do. This is derived from the idea that employees should not be used as objects to generate profit for the

\* Industrial hearing loss is a reportable disease under the Reporting of Diseases, Injuries and Dangerous occurrences Regulations 1995 (RIDDOR). Industrial hearing loss is a prescribed disease under the Industrial Injuries Benefit scheme. Also workers can make compensation claims for Partial Hearing Loss currently ranging from £4,000 to £23,000. Partial hearing loss is defined as slight hearing loss or occasional tinnitus to severe hearing loss/tinnitus in one or both ears. [http://www.industrial-deafness.co.uk/How\\_Much.html](http://www.industrial-deafness.co.uk/How_Much.html)

employer but rather treated as human beings with dignity. Employers' duties of care therefore extend to giving employees safe and comfortable working conditions and pay that is reasonable remuneration for the job that they do. Taking option (a) indicates that Wallcote is shirking this responsibility - doing the bare minimum to protect employees' health whilst knowing that these measures will in practice be ineffective.

### (b) 'Medium term' safety measures

**Economic/practical:** Investing in state of the art earmuffs and other health protection may not be received by employees any better than the PPE already available given the culture of not using this equipment. This means that this would be a costly but ineffective option. Wallcote may also still encounter lawsuits in the long term if they do not enforce the wearing of PPE.

**Legal:** Being a more extensive measure than option (a), this option obviously complies with the Noise at Work regulations. They can also be seen to be doing 'as much as is reasonably practicable' to look after employees' health by investing money in safety equipment.

**Ethical:** Taking this option does show that Wallcote take their duty of care towards employees seriously and that they are willing to spend money on making the work environment safe and comfortable for their workers. Employees, however, also have a duty to their employers. If employers treat their employees with respect then they can reasonably expect their employees to behave as rational human beings in return. This means that employees can be expected to look after their own health and use any safety equipment with which they are provided.

### (c) Extensive safety measures

**Economic:** Some of the older machinery was nearing the end of serviceable life therefore it is prudent given the noise survey results to replace it. Replacing some machinery and damping the rest also reduces the risk of future claims for noise-induced hearing loss. Wallcote can also continue to undertake regular noise surveys to ensure they keep their machinery below the lower action level. Once this regime is maintained they will be able to discontinue undertaking hearing tests and a reduction in their employers' liability insurance could also be reasonably expected once they were able to prove they had effectively reduced the risk of hearing loss in their workplace to as low a level as reasonably achievable.

**Legal:** Being a more extensive measure than option (b), this option obviously complies with the Noise at Work regulations. In addition, the new machinery would be below the lower action level set in the Noise Regulations meaning that Wallcote would be far exceeding legal demands.

**Ethical:** The report identified excessive noise levels on the production floor and Wallcote have a duty of care to eliminate or reduce health risks where identified. By taking option (c) they are fulfilling this duty of care fully.

After the students have been given an opportunity to discuss their reports you should **conclude the lesson**. Below is a summary that you may want to use to round the lesson up. You will also be able to indicate how the class discussion picked up on many of the key features of this case by summarising the points that you noted from the group reports.

This case study highlights the issues surrounding health & safety in the workplace focussing particularly on the duties that employers have to look after their employees. It also demonstrates how some legal and practical concerns can also form a legitimate part of an ethical decision. For example, option (b) offered a solution to Wallcote's problems that was economically, legally and ethically viable. However, the practical point that introducing these safety measures may be ineffective is a factor in deciding whether this is genuinely the right course of action.

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## Student Handout- Preparing your Report

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Your task is to make a case for one of the three options open to Wallcote. You will then present this case to the rest of the class in an oral presentation lasting no longer than 5 minutes. You can design the presentation however you like as long as you stick to the following guidelines:

**Make your case.** You need to give a number of reasons why this option is the right one. Don't just list these reasons but try and back them up with evidence and arguments.

**Research thoroughly.** You will be given access to lots of different resources (books, articles, the internet). Use these resources well to find relevant information to strengthen your case.

**Structure your argument.** You only have a short amount of time to get your point across. Make sure that your presentation is structured and clear. Run through each point in favour of your case and back each point up with evidence and examples. You may find it useful to separate out the reason that Wallcote has for taking the course of action into legal, practical or economical and ethical reasons.

**Present clearly.** You will have to persuade others that yours is the best case. Sound interested in what you are saying and this will make others listen!

### Stuck for ideas? Here are some questions that might help you get started:

- Who are the stakeholders in this case? What are their interests? ('Stakeholders' means everyone likely to be affected by Wallcote's actions both long- and short-term.)
- How are Wallcote related to each of the stakeholders? What duties (if any) do they have towards each of them? Which stakeholder's needs are most important?
- Are there any practical issues surrounding fulfilling each of these duties? (e.g. Are there rules which must be obeyed?) Does solving any of these practical issues create new problems for other stakeholders?

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## Further Reading

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### Safety and Risk

- Baier, A. (1986) 'Poisoning the Well' in MacLean, D. (ed.), *Values at Risk*: 49-74.
- Hansson, S. O. (2003) 'Ethical Criteria of Risk Acceptance', *Erkenntnis* **59**: 291-309.
- Harris, C., Pritchard, M. & Rabins, H. (1995) *Engineering Ethics: Concepts & Cases*, New York: Wadsworth. Chapter 8.
- Kneese, A.V., Ben-David, S. and Schulze, W.D. (1982) 'The Ethical Foundations of Benefit–Cost Analysis Techniques', in MacLean, D. & Brown, P. (eds.) *Energy and the Future*, Totowa, NJ: Rowman & Littlefield.
- MacLean, D. (ed.) (1986) *Values at Risk*, Totowa, NJ: Rowman and Allanheld.
- Parfit, D. (1983) 'The Further Future: The Discount Rate', in MacLean, D. & Brown, P. (eds.) *Energy and the Future*: 31–7.
- Rescher, N. (1983) *Risk: A Philosophical Introduction*, Washington DC: University Press of America.

### Safety at Work

- Ridley, J. & Channing, J. *Safety at Work*, Butterworth-Heinemann Ltd, 2003.
- St John Holt, A. *Principles of Health & Safety at Work*, IOSH services, 2005.

### Official Publications

- Health & Safety at Work Act 1974: [www.healthandsafety.co.uk/haswg.htm-347k](http://www.healthandsafety.co.uk/haswg.htm-347k)
- The Control of Noise at Work Regulations 2005 [www.opsi.gov.uk/si/si2005/20051643.htm](http://www.opsi.gov.uk/si/si2005/20051643.htm)
- HSE: Guidance for Employers on the Control of Noise at Work Regulations 2005: [www.hse.gov.uk/pubns/indg362.pdf](http://www.hse.gov.uk/pubns/indg362.pdf)
- The Management of Health and Safety at Work Regulations 1999: [www.opsi.gov.uk/SI/si1999/19993242.htm-73k](http://www.opsi.gov.uk/SI/si1999/19993242.htm-73k)
- Personal Protective Equipment at Work regulations 1992: [www.opsi.gov.uk/SI/si1992/Uksi-19922966\\_en\\_1.htm-11k](http://www.opsi.gov.uk/SI/si1992/Uksi-19922966_en_1.htm-11k)
- A Short Guide to The Personal Protective Equipment at Work Regulations 1992: [www.hse.gov.uk/pubns/indg174.pdf](http://www.hse.gov.uk/pubns/indg174.pdf)

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<http://www.engsc.ac.uk/downloads/scholarart/ethics/noiseatwork.pdf>