

Environmental Management

Cleaner Air

The content of Section 6.3 Cleaner Air was developed by Gavin Fisher from Endpoint Ltd. for the Boat Building Information Group.

1. What's the story?

The air we all breathe is one of life's fundamental processes. Without clean air we would all get sick and even die. Most of the time we take it for granted - but there are many activities in the boat building industry that can lead to dangerous emissions and reduced air quality that is unacceptable.

This part of the guide outlines some of the issues, and gives some pointers as to what we could be doing, what we should be doing, as well as reminding us what we have to do to stay within the law.

Here are some of the boat building activities that can lead to problems with air quality:-

- Solvents - many solvents are volatile and some are dangerous in the air.
- Burning - whenever something is burnt it produces air pollution - petrol, diesel, oil, solid fuel, paint, waste.
- Spraying - many spray operations result in some overspray or spraydrift.
- Sandblasting - fine sand particles, dust and surface coating particles almost always get blown around when sandblasting.
- Construction - dust can from sawing, sanding, milling, even digging and stockpiling.

Of course most of these everyday activities do not lead to problems. But they will if:-

- It happens too often
- It gets too big
- It involves something particularly nasty

These can - and do - occur at times.

In the next section we will have a closer look at why these might cause problems, and in the third section we will look at what can be done to keep the industry as 'clean and green' as possible.

Legal Lowdown

There are several agencies that have legal and regulatory powers to control activities or levee fines:-

- The local District or City Council - most have provisions to prevent 'nuisance' - eg smells, dust (and noise) that might annoy neighbours (RMA).
- The Regional Council - require air discharge consents for activities with larger discharges to air (RMA) (not common in the industry though).
- OSH (Occupational Health and Safety: Department of Labour) - have wide powers to ensure workers are not exposed to dangerous substances.
- ERMA (Environmental Risk Management Authority) - they licence the import and use of chemicals (HAZNO).
- District Medical Officer of Health (Ministry of Health) - will follow-up complaints from individuals made through hospitals or doctors.

In summary - there are a lot of officials who have the right to come and see what is going on and make sure it's legal and safe!

2. Why the fuss?

We all know about unpleasant smells, the nuisance of dusty sites, and the annoyance of having smoke in our faces, but there is also a growing amount of evidence that some air pollution damages peoples' health in non-obvious ways. There are also substances out there still which we do not fully understand (remember how asbestos used to be the perfect insulation!)

#1 Piece of advice.....TALK.....and then LISTEN!

- Most problems come from the effect you might have on neighbours
- Sometimes these are 'real' (more on that below), but often they are just 'perceived'.
- Most people like to know what's going on.
- Most people are actually quite reasonable. So are most authorities.
- In many cases some simple and obvious solutions can be found that keep everyone happy at no cost or inconvenience to the business. E.g...
 - Give some notice of your work plans
 - Operate some processes only at certain times of day
 - Watch for the wind direction
 - Be prepared to delay a process if a neighbour is doing something special
- A little consideration and compromise can GO A LONG way to solving problems with air pollution from the business activities!

#2 Piece of advice.....ASK!

- If there is any question about (a) whether an activity affecting air quality is allowed, or (b) whether it might have an effect on someone, then ask. The District/City Council is the first stop - ask for the Environment Officer, and the Regional Council is the second stop.
- They may not have the answer - but they will know what the next steps are.
- They would rather hear from early, than have to prosecute you later!

#3 Piece of advice.....MAKE IT EVERYONE'S JOB

- Most staff genuinely want to do the right thing, but worrying about some little air pollution issue is never high on their daily agenda.
- Provide a little information (such as this guide), to everyone on site, at least once a year.
- Consider providing genuine incentives to people who look after their own discharge activities - many large firms have site awards for environmental stewardship - they work!

Solvents

1. Fibreglass, resins, plastics, painting, cleaning, coating, gluing - all involve solvents. Studies in the US show that rates of respiratory illness amongst boat and ship builders is four times higher than average - mostly due to the effects of volatile solvents. Some components - such as styrene - are strictly regulated, but there are many others that are not covered in regulations.
 - These solvents can affect staff health
 - They can drift off the property
 - They are often expensive - so reducing their waste saves money
2. The effects are sometimes obvious - headaches and sore throats - but they also have long term effects on the respiratory system.
3. The main effect is on people working close to the place where the solvent is used (this is an OSH responsibility). In heavy use, the effects can occur off-site (this has much wider implications).

Sample Solutions

Use less wherever possible

Use in a well ventilated area

Choose resins with lower amounts of volatiles - especially styrene

Choose paints and glues with less volatiles (switch to polyester wherever possible)

Reuse / recycle as much as possible, preferably on-site

Have a 'spill kit' on hand (any large supplier can do these)

Burning

1. Just about everything that is burnt produces air pollution - even 'clean' natural gas can produce dangerous amounts of nitrogen dioxide and carbon monoxide in enclosed spaces. Some of the emissions and effects are:-
 - Particulates - including smoke, soot and very fine particulates that cannot be seen. These have short term effects on the respiratory system, but long term exposures are known to lead to pre-mature death, and all sorts of increased cardiac and respiratory illnesses.
 - Nitrogen dioxide - a reactive gas. This exacerbates asthma, causes breathing difficulties, particularly in children and elderly people, and contributes to the 'brown cloud' seen over some urban centres.
 - Carbon monoxide - an odourless gas. This gives people headaches, causes sleepiness, and can lead to learning difficulties in children.

- Sulphur dioxide - a reactive gas. This causes sore throats and stinging eyes. Fortunately this is not a major problem in New Zealand, as sulphur is being removed from many fuels.
 - Organic compounds. Various complex organic compounds can have effects on people, and also lead to ozone formation in urban centres.
 - Toxic compounds. Burning can result in the release of a very wide range of toxic compounds that are linked to disease and cancer.
 - Odours and nuisance. Whilst odours by themselves usually do not have defined health effects, they are the largest source of public complaint in New Zealand, and lead to stresses in the community.
 - Greenhouse gases. Most burning involves fossil fuels, resulting in emissions of carbon dioxide and other greenhouse gases such as methane.
2. Whilst burning cannot be completely avoided, it is in general the single largest source of degraded air quality almost everywhere.
 3. Burning standard fuel products in standard ways can be acceptable, but burning waste, rubber, paint, solvents, glue, off-cuts, etc can lead to potentially serious air pollution problems.

Sample Solutions

Switch to cleaner fuels wherever possible (such as natural gas if available)

Do NOT burn waste

Ensure all areas where burning occurs are well ventilated

Check out the rules with your local Council (they can also advise on options)

Spraying and Sandblasting

1. These are processes which unavoidably result in some material being released into the air. Sometimes that material can be dangerous to workers and neighbours - both because there is simply something in the air, but also because it can contain substances that affect health.
 - Fine sand can be breathed in causing respiratory problems.
 - Paint or surface coatings can contain toxic material.
 - Solvents used in spraying can burn or aggravate people.
2. These industrial processes are controlled by OSH guidelines and many by-laws. For on-site operations they are covered by H&S regulations. However any off-site effects also need to be avoided.
3. Overspraying tends to be a significant cause of public complaint in many areas - both industrial and rural.

Sample Solutions

Follow guidelines supplied by manufacturers and suppliers.

Use a spray booth - and keep the filters up to specification.

Only spray/sandblast when the wind speed is low.

Also when the wind direction doesn't carry material to sensitive neighbours.

Choose equipment that minimises or, even captures, overspray/blasting media.

Conduct operations with a buffer distance to neighbours - the larger the better.

Construction

1. Processes involving construction - from simply sawing wood, through to a major building development - can cause air pollution. Many small or short term activities are of little concern, but larger building projects or on-going work may need some form of mitigation.
 - Wood dust and emissions from sawing other materials (eg fibreglass) cause particulate effects as described earlier.
 - Earthworks often create large amounts of dust.
 - Chemicals and foul water create odours.
2. Many of the emissions issues are taken care of by contractors, and many are specified within Building Consents.
3. Many boat building operations do engage in on-going construction-like activities associated with the industry, and these need to be watched for potential air quality problems.

Sample Solution

Use reliable contractors, and specify "No adverse emissions" in the contract.

Get Resource Consents for all significant projects.

For on-site activities, apply the same rules as noted above for 'burning'.

Use buffer distances, or screening with plants and trees.

3. Protecting our clean air

The air is a precious resource - as much in the workplace as in the home or in the wider outdoors - it's worth protecting! Some final pointers, that may seem obvious, but we all have our part to play:-

- When upgrading equipment with a petrol or diesel engine (machinery, plant, vehicle, boat, lawnmower or whatever) - ask "What are the emissions? Is the best I can do from the choices I can afford?"
- If you need to burn some rubbish - DON'T. Make the choice to have it taken away by the Council or a reliable contractor.
- If spraying or sandblasting - make sure the winds are not taking material off site onto a neighbour or where people might be (if this can't be avoided maybe a relocation or screening/filtering solution is needed).
- If you need to use a new chemical - make sure it checks out. If in doubt call your local Council, call ERMA, call the supplier, call others in your industry. Be sure and be safe.
- If you spill something volatile - chemicals, fuels, paints - don't just leave it and don't try and flush it into the wastewater system. If spills are possible - have a 'spill kit' on hand - these are easy to use, not expensive and can save a lot of grief. If a spill presents any danger - call the Fire Department. Let them make the call - they know a lot more about it than any of us!
- If anyone on site - staff, customer, or visitor - complains of illness, headaches, sore throat, stinging eyes, or anything else that might be due to something in the air - investigate. It's not worth it to cause people to suffer, and OSH have some serious powers to fine if appropriate actions are not taken.

Many industries in New Zealand are taking pro-active measures to ensure they are as clean as possible - there is no reason why the boat building industry shouldn't join this elite group and enhance the whole country's enviable image for having clean air.

Other information sources

Local and Regional Council website have many pointers and sources of information.
www.councilname.govt.nz

The Ministry of the Environment has many guides and more detailed information on air quality and effects in NZ.

www.mfe.govt.nz

The international boat building industry web sites, particularly those in the USA, have a number of specific study results, and more detailed information on the effects of processes and how these can be mitigated.