

DIESEL PARTICULATE EXPOSURE

A HEALTH RISK

SAFETY BULLETIN

ISSUE# 03-2018

Diesel exhaust comes from the burning of diesel fuel and is a complex mixture of particulate, gases and hydrocarbon vapours. Diesel exhaust contains diesel particulate matter (DPM). It is that puff of black smoke you may see when a diesel engine is started or revved.

The DPM is chemically complex, but primarily consists of elemental carbon with a variety of other chemicals affixed to the surface.

Years of prolonged exposure to DPM can cause:

- Lung cancer
- Other respiratory diseases
- Cardiac diseases



CHALLENGES

There are currently no accepted exposure limits for DPM that apply to the oil and gas industry. There are exposure limits for the individual gases in diesel exhaust such as carbon dioxide, carbon monoxide and nitrogen dioxide, but compliance with these exposure limits often does not afford adequate protection against the DPM hazard. Additional challenges exist because of varied approaches on air sampling and analysis of diesel particulate matter.

HOW CAN EXPOSURE OCCUR?

Exposure to DPM can occur in the following ways:

- Failure or intentional bypass of diesel exhaust emission controls, such as filters or tailpipe exhaust ventilation
- Not adhering to manufacturer's recommendations on engine maintenance
- Workers in the line of fire of a diesel exhaust pipe; in these situations, workers may notice diesel particulate matter (soot) on their faces
- Exposure to low-level diesel particulate in the air when numerous emission points are located near or upwind of a worker

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WHAT CAN SUPERVISORS DO?

- Ensure all preventative maintenance is conducted on diesel engines
- Ensure that diesel exhaust engineering controls, such as filters and local exhaust ventilation, are present and functioning in accordance with the manufacturer's recommendations
- Conduct filter regeneration burns in accordance with the manufacturer in a safe location away from potential flammable atmospheres and materials (the regeneration process may generate hot embers released from the exhaust pipe)
- Assess worksites for exposure risks that may put workers in the line of fire of diesel exhaust or where elevated exposures could occur

WHAT CAN WORKERS DO?

- Raise issues or concerns about engine performance, such as unusual amounts of soot exhausted from diesel engines
- Use emission controls as indicated by manufacturer and never bypass emission controls
- Minimize or prohibit diesel engine idling
- Tell your supervisor about line of fire situations, such as exhaust pipes venting directly at workers, and look out for signs of direct exposure such as soot on your face
- Limit your time in work environments where diesel particulate is present and use all available controls as mandated by your supervisor/employer

REFERENCES

- [Control Measures: For Diesel Engine Exhaust Emissions in the Work Place](#)
- [OSHA Diesel Exhaust/Diesel Particulate Matter](#)
- [IARC Diesel Engine Exhaust Carcinogenicity](#)
- [Health Canada Risk Assessment for Diesel Exhaust](#)

PRESENT LIKE A PRO

Before you begin:

Review this material, make sure you understand it and how the topic can be applied.

Research your own company's experience so you can provide examples that pertain to your work areas.

Anticipate questions and be prepared to answer/discuss them.

If you're not able to answer a question, let the person know you will find the information and make sure you follow up.

Consider the audience and their experience with the topic (i.e. how familiar are they with the topic or the terms being used?).

Challenge the group:

Identify any areas or tasks on your worksites that may result in diesel exposure.

Ask the group if anyone has experienced irritation from diesel exhaust exposure.

Ask the group if anyone currently works in the line of fire of diesel exhaust.

Discuss the diesel engines on site and if any non-typical emissions are occurring that should be investigated.

Challenge the group to find solutions to limit diesel particulate matter exposures on their worksites.