Critical risk: Hot water and steam

What is the risk?

Hot water and steam are routinely used in the meat processing industry for cleaning and sanitizing. Hot water and steam are used to clean and sanitise:

- knives and equipment
- boots
- paunch
- carcasses
- scalding of pigs
- boilers
- rendering
- plant washing at the end of a shift
- sterilisation of the viscera table, splitting saws and brisket cutters
- pasteurisation cabinets (hot wash carcase cabinets).

Examples of accidents that may occur in meat processing plants leading to scalds or burns include:

- a worker placing their knife too far into the hot water (>82°C) when sterilising the knife
- hot water being splashed into the boot during boot washing
- hot water splash during sterilisation of splitting saws and brisket cutters.

Burns that require hospitalisation as an in-patient are notifiable incidents under health and safety legislation. The legislation states that serious burns must be notified to the relevant state authority:

“A burn requiring intensive care or critical care which could require compression garment or a skin graft. It does not include: A burn that merely requires washing the wound and applying a dressing.”

In addition, the site where the incident occurred must not be disturbed until an inspector arrives at the site or directs otherwise.
Water used as a sanitising agent for knives, steels and other equipment is used at a temperature of 82°C or higher. Water for handwashing is at temperatures between 34 and 45°C. As scalds or burns may result from water at a temperature as low as 50°C this means there is significant risk of scalds or burns in meat processing plants as almost every job on the floor has at least one component of using hot water, for example to clean knives and equipment.

Exposure to hot water or steam may cause scalding and/or first, second or third degree burns. A burn or scald is generally very painful. Burns or scalds appear red, blistered, and may be swollen or look wet, shiny and may be white or discoloured. The extent of the injury depends on the temperature of the water and the duration of the exposure, e.g. hot water collecting in boots may lead to a serious injury because of the time it takes to get the boots off.

Burns that affect only the superficial skin are known as superficial or first-degree burns. The treatment for superficial burns or scalds is washing the wound with cold running water and applying a dressing. When damage penetrates into some of the underlying layers, it is a partial-thickness or second degree burn. In a full-thickness or third degree burn, the injury extends to all layers of the skin. A fourth degree burn additionally involves injury to deeper tissues, such as muscle or bone.

The treatment required depends on the severity of the burn. Superficial burns may be managed with pain relievers, while major burns may require prolonged treatment in specialized burn centres. Cooling with tap water may help relieve pain and decrease damage. Partial-thickness burns may require cleaning, followed by dressings. Full-thickness burns usually require surgical treatments, such as skin grafting. Extensive burns often require large amounts of intravenous fluids because the subsequent inflammatory response will result in significant capillary fluid leakage and oedema. The most common complication of burns is infection which would require further treatment from a medical practitioner.

How can the risks of using hot water and steam be reduced to the lowest possible levels?

Work health and safety laws mandate that senior management must take a risk management approach to minimise the risks to health and safety in the workplace. This involves taking a systematic approach to identifying all the risks associated with hot water and steam used in the workplace and implementing control measures to eliminate the risks or, if that is not possible, to reduce the risks to the lowest possible level. This includes:

- identifying situations in the workplace where people may be exposed to hot water or steam
• assessing the risks associated with each situation
• identifying and implementing control measures that reduce the risks to the lowest possible levels
• reviewing the effectiveness of these control measures and making adjustments as needed
• reporting, investigating and implementing control measures in regard to any incidents to ensure they don’t happen again
• reporting incidents of serious burns (i.e. burns that require hospitalisation as an in-patient) to the relevant state authority and not disturbing the incident site until an investigation is conducted by the authority or the authority gives permission
• documenting this process so that there is evidence of everything that has been done in the workplace to reduce the risks to the lowest possible levels.

It is important that in identifying control measures the primary focus is on identifying and implementing the most effective control measures. The most effective control measures include elimination, substitution and engineering controls. Every effort should be made to implement these types of control measures. Examples of control measures follow.
### Hierarchy of control measures

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Types of control</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Most effective</td>
<td>Elimination</td>
<td>Introducing a robot so that a worker is not exposed to the hot water or steam, e.g. automate scalding of pigs</td>
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<td></td>
<td>Substitution</td>
<td>Implement the use of high pressure hoses for plant cleaning using cold water rather than hot water</td>
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<td></td>
<td>Isolation</td>
<td>Plant cleaning is isolated by carrying it out when no workers are on site</td>
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<td></td>
<td></td>
<td>Automate and enclose scalding of pigs</td>
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<td></td>
<td></td>
<td>Enclose cleaning of rendering plant</td>
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<tr>
<td></td>
<td>Engineering controls</td>
<td>Reducing temperature of water used in line with requirements</td>
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<tr>
<td></td>
<td></td>
<td>Cleaning conducted automatically in enclosed units, e.g. in rendering</td>
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<tr>
<td>Least effective</td>
<td>Administrative controls</td>
<td>Place warning signs or stickers near hot equipment or surfaces.</td>
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<td></td>
<td></td>
<td>Follow safe working practices</td>
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<td></td>
<td>Personal Protective Equipment</td>
<td>Heat resistant gloves, aprons, boots</td>
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<td></td>
<td></td>
<td>Gaiters over boots to stop water entering boots</td>
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### What are my responsibilities as a supervisor?

As a supervisor you are responsible for implementing workplace policies and procedures with your team. You should be constantly taking a risk management approach to ensuring the safety of the workers in your area. You are on the alert to recognise any issues in your area, assess the situation and take corrective action immediately as appropriate.

You should also consult with your team regularly as a routine part of normal duties. Health and safety needs to be a routine issue discussed in the normal course of work. Your workers need to feel that they can raise health and safety matters and you will act on their concerns. You need to check that your workers are aware of the risks associated with working with hot water and steam and that they take precautions in line with work instructions including wearing PPE as required. You and your workers need to know what to do if a worker receives a scald or burn. This includes:

- knowing the designated first aider
• knowing the location of the first aid kits and/or rooms
• knowing the procedure when first aid is required
• ensuring an injured worker receives first aid
• reporting any accident resulting in injury in accordance with workplace procedures
• participating in incident investigation to ensure the incident does not happen again.

As a supervisor you need to understand what to do in the event of a serious burn. The first priority is to remove people from danger and organise treatment for any injured persons. If you assess that the person may require hospitalisation then the incident is a notifiable event. You must not disturb the incident site and you must set in motion your company’s procedure for notification of a serious incident to the relevant state health and safety authority.

How do I find further information?

For further information you should refer to the relevant legislation in the area. To do this you should go to the work health and safety authority in your state and search their website for relevant material:

• WorkCover NSW - www.workcover.nsw.gov.au
• Worksafe Vic - https://www.worksafe.vic.gov.au
• SafeWork SA - www.safework.sa.gov.au
• WorkCover WA - www.workcover.wa.gov.au
• WorkCover Tas - www.workcover.tas.gov.au

You may also go to the national work health and safety authority responsible for reforming WHS legislation. This is Safe Work Australia (www.safeworkaustralia.gov.au). Relevant publications include:

Safe Work Australia, November 2013 Incident notification fact sheet

Other publications include: