
5. The role of plumbers in risk assessment and risk management

The supply of safe water and the removal of human waste are vital for health and well-being. The main aim of plumbing systems is to collect, transport and distribute water to individuals in a community, and to remove liquid waste. Unfortunately, all of these beneficial processes incur risks. These risks include contamination of water sources with bacteria, accidental cross-connection of drinking-water supply and waste removal systems, and chemical contamination from corrosion of pipes and other fittings. Thus, the second aim of plumbing systems must therefore be to manage risk.

Risk management uses a variety of different strategies. First of all, risks must be recognized, analysed and evaluated. Then the risks are minimized by a number of means, the most fundamental being system design and construction or assembly using appropriate techniques and materials. A fundamental requirement is the use of quality assurance systems to ensure that plumbers are well trained and that they adhere to a code of good practice. Some risks cannot be eliminated and the resultant financial risk must be either accepted by the plumber or transferred by means of insurance.

Plumbers are trained to design, install and maintain plumbing systems. However, the work of plumbers goes beyond the provision of plumbing systems; they must manage the risks associated with plumbing installations. They share this risk management role with public health officials. Finally, in a world that is now increasingly aware of the value of natural resources, plumbers and other plumbing professionals play a vital role in water conservation.

5.1 Risk recognition

Risk recognition is based on a comprehensive understanding of all potential hazards that may arise in establishing and maintaining a plumbing system. For example, the Romans recognized the undesirability of contamination of water from soil and human and animal waste and they built aqueduct systems to deliver clean upland water to their cities, and sometimes used lead pipes. The Latin word for lead (plumbum) gave rise to the common name for the plumbing profession. It has taken almost two thousand years to recognize the risks associated with lead pipes and corrosive water, and lead use was discontinued in drinking-water systems relatively recently. The history of lead use is an important reminder that new technologies will often bring new and unexpected risks.

Constant vigilance and research are necessary to uncover these new risks as they arise and to rapidly correct them.

5.2 Risk evaluation and analysis

Once a risk has been identified, the nature of the risk must be analysed and its relative importance needs to be evaluated. The analysis of the risk should reveal what causes the risk; the evaluation of the risk in its context will enable a judgment to be made about what action to take. In some cases, a risk might be identified but assessed to be very low in importance and costly to eliminate. In this case, the evaluation might lead a community to accept the risk and simply monitor the problem. On the other hand, the evaluation of another risk might demand urgent action to protect the community.

5.3 Risk abatement

Once a risk has been recognized and evaluated as being important, steps must be taken to minimize the risk. Risk abatement is the main strategy for managing risk in the domain of plumbing. Plumbing risks can be prevented and minimized by education and training and by the adoption of quality assurance systems such as codes of best practice. Many countries enforce these codes of best practice by establishing laws and regulations that demand certain standards of practice. For example, modern codes of practice prohibit the use of certain dangerous materials, such as lead, in pipes that supply water for human use. Risk abatement strategies are only effective if their application is assiduously maintained. Risk abatement in plumbing requires both the community and individuals to make a major continuing investment in time and money to prevent risks, and to minimize risk once discovered.

5.4 Risk acceptance and risk transfer

Because it is impossible to identify and eliminate every possible risk, plumbers must face the possibility that even with good standards of practice there will be occasions when some problem with a plumbing installation will occur. In some of these situations people may be made ill or injured and the plumber may be held responsible. There are three possible ways to deal with these kinds of circumstances. The first and normally the best ethical approach is to accept responsibility and rectify the problem. The second is risk acceptance – the plumber is confident that the risk is very low and makes an informed judgment not to correct it. In this case the impact of being wrong would be financially catastrophic because of legal liability. In the third option, then, the plumber can transfer the financial risk to an insurer by paying an annual fee. Although this practice is possible in developed countries it might be less feasible in many developing countries.

Regulation of plumbing technology and practice is intended to minimize public as well as private health risks. The main instrument of regulation is the development and implementation of good practice guidelines, commonly called a code of practice. There is no doubt that the implementation of a well-designed plumbing code of practice will assist those who design plumbing systems and the plumbers themselves, and help to protect the public.