Prevention initiatives and the ALARA programme (As Low As Reasonably Achievable)

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As part of any prevention initiative, one has to be able to quantify the cost and determine the degree of risk. Indeed, preventing the consequences of occupational exposure, whether due to toxic substances, physical radiation or biological risk, comes at a cost. This cost needs to be integrated into the programme in proportion with the expected result.

The whole difficulty lies in the definition of 'result', as this can range from the total eradication of illness to diminished incidence, and in the resources implemented to achieve this result.

Measuring the result is difficult as illnesses develop against a background, and gauging their growth calls for a number of in-depth epidemiological studies that are difficult to put in place.

Background has to be factored in, and many of our politicians would prefer it not to exist, in order to be able to implement the precautionary principle. In this instance, there is no exposure consequently, no possible link between the illness and exposure to toxic substances.

This situation rapidly gave rise to the development of the ALARA concept by radiation protection specialists. The concept elaborates on the principle of lowering the dose rate received by a person exposed to ionising radiation, taking into account the ability to lower the amount of exposure within a reasonably achievable context, while also factoring in economic considerations. However, the concept obviously implies that low doses do not cause any damage and that employees provided with protective equipment can be exposed to radiation, as long as the correlation between the effects and the dose is taken into account. It is this correlation that is the key to the concept : lowering the received dose with a view to eliminating any perceptible effects.

The same concept could apply to toxic chemicals, but the correlation between the effect and the dose received is without doubt a prerequisite factor. If the reverse argument prevails, protecting the individual without totally eliminating exposure is merely a trap.

This is true for the majority of occupational exposures to toxic substances. Asbestos is an excellent example where the legislator has defined low occupational exposure thresholds, but where asbestos fibres are nevertheless still found to exist.

However, in the case of certain neurotoxic substances, exposure must be nil because of these substances' high toxicity levels.

In everyday life, there are myriad examples the ALARA programme, such as initiatives to reduce alcohol and tobacco consumption. Even when it comes to alcohol, we need to qualify our statements because small doses are good for…our health.

The ALARA concept has taken on a new dimension – that of social acceptance. Indeed, it has become unthinkable to expose someone to a toxic substance if its effects are known, and the public cannot comprehend an acceptance of the associated risk.

The people in charge, and in particular the public authorities, do not want to be exposed to the risk of accountability. They have consequently redirected the ALARA principle towards one of precaution : because we cannot know, we eliminate the exposure to risk.

How can a company manager adhere to such a principle without causing his business to shut down?

Precautionary concept → elimination of exposure to risk → cessation of activity incurring the risk → shutdown of business.

This has very recently been demonstrated by the mad cow crisis. The public authorities do not want to accept the risk and therefore put a stop to consumption, without adopting an ALARA approach that could enable ongoing exposure to certain parts of the animal.

In another area, we need to give consideration to an industrial safety programme, i.e. accident prevention, an area where the company manager and the prevention experts cannot afford to remain passive. Everything must be done to prevent accidents from occurring and to prevent the industrial process from undermining the individual's integrity. It is true that the initial tendency would be a refusal to accept human accidents, as no-one could imagine that the accident could be predicted or could eventually occur.

Deeper consideration of the matter gives rise to the need for performing risk analyses, in which the various risks must be specified with the possible causes of an accident. Only once the analysis has been performed and the risk quantified can a stance be taken. Protective measures have to be implemented. They involve a cost and enable the risk to be brought down to an acceptable level. This is the level that forms the basis of the ALARA principle advocated by radiation protection experts.

The notion of acceptance encompasses economic acceptance, social acceptance and of course political acceptance, which can differ from one country to another depending on its history.

To conclude, the ALARA principle in all western countries applies uniformly to:

- social risk
- chemical risk
- biological risk, and
- physical risk.

All these initiatives have a price tag attached and a cost that we have to bear. In the eyes of industrialists, the reverse attitude could only have adverse effects on the continuity of their business.

Who would be prepared to accept a radiation accident ? Who would tolerate exposure to a solvent or to asbestos ? Who would be willing to accept aeroplane accidents? As things stand today, no-one would be willing to acknowledge such an admission.