

COMPENSATION REGIMES APPLICABLE TO RADIATION WORKERS IN OECD COUNTRIES*

The purpose of this Note is to consider the compensation regime in force in OECD Member countries for workers who may be exposed to ionising radiation. It aims in particular to provide answers to the following questions and, in doing so, to identify similarities and differences which may exist between these different countries in this field:

- What is the basis for the worker compensation regime applied in the country concerned for workers exposed to ionising radiation (*i.e.* risk, exposure, probability of causation, etc.)?
- Are there different regimes for nuclear fuel-cycle workers and other workers exposed to ionising radiation (*i.e.* in hospitals, laboratories, industrial radiography, etc.)?
- How is worker compensation implemented (for example, is there a threshold for risk, exposure or probability of causation below which workers are not compensated; are all exposed workers compensated; do compensation amounts depend upon risk, exposure or probability of causation; etc.)
- How do the framework and basis for compensation of workers exposed to ionising radiation fit into other worker compensation schemes (for industrial accidents, for example)?

Introduction

The first overriding characteristic which emerges from our study is the general absence of a specific compensation regime applicable to radiation workers only. Thus, in the vast majority of OECD countries, with the notable exceptions of Korea¹ and the UK,² radiation workers are subject to

* This study was prepared by the Secretariat of the OECD Nuclear Energy Agency (NEA) on the basis of a survey carried out by the NEA Nuclear Law Committee and the Committee on Radiation Protection and Public Health concerning the worker compensation regimes in force for radiation workers in OECD Member countries.

1. In Korea, Article 109 of the Atomic Energy Act and its implementing decree provide that nuclear fuel-cycle workers shall be compensated pursuant to compensation standards established by the nuclear operator and approved by the Minister of Science and Technology. However, from the information made available to us, it would appear that there is no substantive difference between the regime governing nuclear fuel-cycle workers and that governing other radiation workers, as Article 4 of the “Compensation Standards Model” provides that standards governing the payment of compensation to workers who have suffered damage due to exposure to ionising radiation shall comply with the provisions of the Industrial Accident Compensation Insurance Act.
2. In the United Kingdom, the Compensation Scheme for Radiation Linked Diseases (CSRLD) provides compensation to workers exposed to ionising radiation. This Scheme is of a voluntary nature and is not legally binding. Its use, however, is recommended by the Unions, who operate the Scheme jointly with the participating employers. It provides an alternative to legal action, but cannot prevent claimants from taking legal action (unless a payment has already been accepted under the Scheme).

the general worker compensation regime rather than having a specific regime which applies to the exclusion of the general regime.³ In general, worker compensation legislation applies to all workers regardless of the type of work they perform.

There do, however, exist within some of the general worker compensation regimes in OECD countries, tables or lists which set out those occupational illnesses which are presumed to be caused by exposure to ionising radiation. By way of example, such tables or lists exist in the Czech Republic⁴ and France.⁵ They can be exhaustive in nature, but usually are simply representative of some of the illnesses which may be caused by such exposure.⁶ Other countries simply have a reference to “diseases caused by exposure to ionising radiation” as a generic category within their list or table of occupational diseases (*e.g.* Denmark, Germany).

Another factor which appears to be common to all OECD countries is that the compensation is awarded on a “no-fault” basis: once the claimant has fulfilled the required criteria in terms of existence of risk, exposure to radiation and causal relationship, he/she will not be required to show that his/her employer was at fault in order to receive a compensation award.

There do not appear to be many countries, with the exception of Korea⁷ and the USA,⁸ which operate a distinction between the regime applicable to nuclear fuel-cycle workers and that applicable to other workers exposed to ionising radiation (*e.g.* in hospitals, laboratories, industrial radiography etc.).⁹

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3. See, however, Footnote No. 8 *infra* in respect of the RECA federal compensation programme in the USA.
 4. Decision of Government No. 290/1995/Coll.
 5. Table of occupational illnesses resulting from exposure to ionising radiation – Table No. 6 – established by an Act of 1 January 1931, as amended. The original Table was devoted to afflictions caused by X-rays. The version of Table No. 6 in force today dates from 1985 and is at present undergoing revision.
 6. It is interesting to note that a complementary system of compensation was introduced in France in 1993, with a view to addressing the imperfections due to the inflexibility of using such tables. Its objective is to allow workers, whose illness does not appear in the tables or does not fulfil the prescribed criteria, to claim for compensation for occupational illness, on condition that the work-related origin of the affliction is proven as a result of an investigation after due hearing of both parties.
 7. In Korea, nuclear fuel cycle workers are governed by the Compensation Standards as described in Footnote No. 1 *supra*, whereas other workers exposed to ionising radiation are covered by the Industrial Accident Compensation Insurance Act and the Nuclear Damage Compensation Act.
 8. In 1984, the US Congress established the RECA federal compensation programme for uranium miners, military veterans exposed to atmospheric nuclear weapons testing and citizens exposed to downwind fallout from these tests. There are also provisions which apply specifically to United States Maritime employees. A new federal compensation programme for workers involved in the fabrication, research and testing of nuclear weapons was passed by the US Congress in October 2000. For all other workers, individual states will continue to administer their claims, as is currently the case. Federal government only intervenes in cases with broad cross-state involvement.
 9. This statement is made with the proviso that, as outlined above in Footnote No. 2, the regime in force in the UK is of a voluntary nature and therefore it only applies to workers employed by the participating employers. The only alternative for workers whose employers do not participate in the Scheme is legal action, the Department of Social Security or War Pensions scheme.

It is worthy of note that both of the principal international conventions in force on third party liability for nuclear damage contain a provision¹⁰ which expressly provides that it is left to national law establishing national health insurance, social security, worker's compensation or occupational disease compensation systems to determine (a) whether benefits under such systems should be retained for employees whether of the installation in question or employed in other establishments and (b) whether employees should also be entitled to compensation under the Convention.¹¹ The national law will also determine whether the bodies responsible for such payments may exercise a right of recourse against the operator to recover payments made, to the maximum limit of the operator's liability under the Convention.¹²

It should also be pointed out that there is no European Community regime or system for compensation of workers in the case of damage caused by exposure to ionising radiation under Chapter 3 of the Euratom Treaty or in the derived secondary legislation. Nor does the Community legislation on energy contain any provisions relevant for our purposes. The European Commission has therefore expressed the view that this issue is governed by national legislation.¹³

Types of affliction compensated

In general, compensation is provided for permanent physical or mental injury, economic loss, (*i.e.* reduction in or loss of salary) and medical expenses. Compensation is generally awarded for both deterministic afflictions (caused by extensive exposures or irradiation, *e.g.* radiation burns) and stochastic effects (which often appear a long time after the exposure, *e.g.* malignant diseases). The criteria upon which compensation is based tends to differ between the two (see *infra* under "Proof of a causal relationship"). Compensation is also frequently awarded for accidents taking place during the journey to and from work.

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10. Paris Convention on Third Party Liability in the Field of Nuclear Energy: Article 6(h); Vienna Convention on Civil Liability for Nuclear Damage: Article IX (1). The text of the two provisions is almost identical and reads as follows in the Paris Convention: "Where provisions of national or public health insurance, social security, workmen's compensation or occupational disease compensation systems include compensation for damage caused by a nuclear incident, rights of beneficiaries of such systems and rights of recourse by virtue of such systems shall be determined by the law of the Contracting Party or by the regulations of the inter-governmental organisation which has established such systems".
 11. By way of example, in Japan, where the damage suffered exceeds the limit set in the Workers' Accident Compensation Insurance Law, workers are entitled to receive compensation for the total amount of damage suffered pursuant to the Japanese Law on Compensation for Nuclear Damage (1961, as amended). Similarly, in Sweden, employees in the nuclear installation are entitled to compensation under the Nuclear Liability Act (1968, as amended) for the part of the damage not covered by the Act on General Social Insurance for Work-related Injuries and Diseases.
 12. For further information on the relationship between nuclear operators and their insurers with Social Security authorities, see the paper (in French) submitted by Jacques Deprimoz at the Nuclear Inter Jura 1993 (Biennial Congress of the International Nuclear Law Association) – Proceedings, page 169.
 13. The only exception in this regard is in respect of officials of the European Commission working at the Joint Research Centre of the European Community, since the Commission officials are covered by the in-house insurance system rather than by the national law of the Member State concerned.

Types of compensation

Medical expenses appear to be reimbursed in most countries at 100%. In certain countries, a daily allowance is provided during sick leave. There is often a fixed amount of compensation for certain injuries suffered (*e.g.* loss of an eye or a limb), based on the degree of permanent impairment caused by the injury. Sometimes the legislation specifies the amount of compensation payable for economic loss based on the degree of wage loss suffered by the worker. Occasionally a ceiling is established in respect of compensation for personal injury and economic loss, for example in Australia. In any event, an allowance is provided in the case of permanent disability. France furthermore provides for partial protection of the worker's employment contract.¹⁴

Criteria to be fulfilled in order to obtain compensation

Existence of risk

The input which we received did not appear to indicate that many countries have an express requirement concerning the pre-determined existence of a risk in the activities carried out by the injured party. However, the French legislation does provide that the victim must exercise a profession which is liable to cause the affliction which he/she claims to be work-related.

Proof of exposure

This is one area where responses seem to differ, as the regimes applicable in certain countries (*e.g.* Spain) require there to be proof that dose limits have been exceeded in order to honour a claim, whereas others (*e.g.* United Kingdom) may grant compensation although the dose limits have not been exceeded.

Proof of a causal relationship

Proof of a causal relationship between the damage suffered and the work carried out by the victim is always required.

Generally, such causal relationship is proved in the case of a deterministic affliction if the threshold dose has been exceeded. There are well-established radiobiological data in relation to threshold doses (*e.g.* the values in Table IV-1 of the International BSS 1996). In other cases (*e.g.* France), deterministic afflictions are assimilated to work-related accidents and therefore if an injury takes place during working hours in the workplace, the worker benefits from a presumption of causality.¹⁵ Thus he/she only needs to establish the material facts of the accident, rather than its occupational character. This is also the case in Norway.

In the case of stochastic afflictions, diseases may be recognised as being of occupational origin through the use of tables or individual evaluation or both.

14. Since the adoption of the Act of 7 January 1981.

15. The victim does not benefit from the presumption of causality and must therefore prove the occupational character of the accident if it was not immediately noticed or where the ensuing injury did not appear for a certain amount of time after the accident.

In France, Table No. 6 (as described in Footnote No. 5 *supra*) sets out the list of afflictions caused by exposure to ionising radiation and also provides a sample list of the principal activities which may cause these afflictions. Where a victim suffers from one of the listed diseases, and carried out activities listed as possibly causing such affliction, if the criteria in relation to time limits have been respected, the employee is not required to prove causation between his/her illness and his/her profession. However, the complementary system introduced in 1993 as described in Footnote No. 5 *supra* does require that the work-related origin of the affliction be proven if the illness does not appear in the Table or if other criteria established in the Table have not been fulfilled.

Where an individual evaluation is carried out, compensation can be based on the probability of causation calculated with the use of individual dosimetric and epidemiological data (*e.g.* Czech Republic, Germany). In most countries, the calculated value of the probability of causation must exceed 50%. Some exceptions are made where such value is lower than 50%, taking into account other circumstances like other occupational carcinogens, incomplete dosimetric data etc. The Compensation Scheme for Radiation Linked Diseases in the UK provides that payment is awarded where the assessed probability (cp) that the occupational radiation exposure caused the illness is 20% or more.¹⁶

In the USA, the programmes described in Footnote No. 8 *supra* use either a “probability of causation” approach or a “presumptive” approach based on exposure history and type of disease. The former approach uses the radioepidemiological tables developed by the US National Institute of Health in 1985, which are currently being updated. The state provisions vary widely, although each state uses a test based on injuries and illnesses that “arise out of or in the course of employment”. The burden is on the worker to prove damage (illness) and causation, and each case is examined on its own merits. Depending on how this test is applied within each state, the worker may face a challenging burden in demonstrating that their disease arose out of exposure to radiation.

In Denmark, the legislation provides that if non-occupational factors have contributed to the illness or damage suffered, such factors can be recognised and compensation will only be granted for that part of the disease caused by the occupational exposure. Similarly in Norway, it is necessary to prove that the radiation exposure was substantial to such a degree that the establishment of liability is considered reasonable, although such exposure may not necessarily have been the primary cause of the illness.

Thresholds

As described *supra*, there exists in Spain a requirement that the dose limits have been exceeded, thus constituting a threshold in terms of exposure to radiation. In the regimes examined for

16. A sliding scale of awards is applied as follows:

- $cp < 20\%$ Nil payment
- $20\% \leq cp < 30\%$ $\frac{1}{4}$ payment
- $30\% \leq cp < 40\%$ $\frac{1}{2}$ payment
- $40\% \leq cp < 50\%$ $\frac{3}{4}$ payment
- $50\% \leq cp$ Full payment

The amount of compensation is determined in each case in the same manner as a successful legal claim and the appropriate fraction is then applied.

the purposes of this study, there do not appear to be any thresholds for risk. Thresholds governing probability of causation are described *supra*.

In certain countries, a threshold has been fixed in relation to the permanent partial invalidity of the victim (in France, this level is fixed at 66.66%¹⁷ in the case of permanent partial invalidity resulting from an illness which is not designated on the Table).

In Sweden, pursuant to the Act on General Social Insurance, injury must cause impairment of working capacity by at least one quarter, and under the Act on General Social Insurance for Work-related Injuries and Diseases, the insured person's working capacity must have been reduced by at least one-fifteenth in order to benefit from compensation in the form of an annuity for loss of income. Such annuity depends on income level (up to a maximum ceiling)¹⁸ and on pension payments.

Conclusion

The results of this Study demonstrate a certain level of homogeneity in radiation worker compensation regimes in force in OECD countries with regard to the strict or no-fault basis upon which compensation is granted, the requirement to prove a causal relationship between the damage suffered and the tasks carried out by the victim (although the manner in which such probability of causation is determined varies substantially), and the types of compensation to which workers are entitled. Those areas where marked differences exist include the existence or not of exhaustive or representative tables setting out afflictions presumed to be of occupational origin, the role which non-occupational factors may play in preventing or reducing the payment of compensation and accordingly the degree of difficulty for victims in successfully filing a claim for compensation, in particular in respect of stochastic afflictions.

17. Decree No. 93-692 of 27 March 1993.

18. This ceiling is fixed at Swedish kroner (SEK) 275 000.