

Public scientific expertise and judicial risks: the case of radon

Marie-Hélène Massuelle
Institute for Protection and Nuclear Safety (IPSN)
BP 6, 92 265 Fontenay aux Roses Cedex, France

INTRODUCTION

Only in the middle of the 1990s did cases related to high radon concentrations in dwellings emerge in France and receive substantial publicity. This irruption of radon as a public health issue came with an improved scientific knowledge and the existence of French researchers able to develop expertise. We are interested here in the legal implications of issues that arise from the lag between the activity of experts and the regulatory activity in the domain of radon. We use the term expertise very broadly, to cover the practical application of research findings, the relation of the researchers with the community, and finally the acts by which experts provide their knowledge to the community. We first examine how scientists developed the radon issue and how they move from research to expertise; here we try to characterize the various needs for radon expertise. We then discuss the legal difficulties associated with radon expertise. Called upon for operational expertise in a legal framework that is not always well-defined, experts can be exposed to legal risks, can see their legitimacy impaired, and may perhaps find themselves legally responsible.

1. FROM RESEARCH TO EXPERTISE

1.1. THE EMERGENCE OF A NETWORK IN RADON RESEARCH AND EXPERTISE IN FRANCE

The structuring of scientific activity

Radon was already a scientific research topic in France in the middle of the 1970s. The research on health effects focused on animal studies and occupational safety for uranium miners. Residential health issues appeared in the 1980s. The Institute for Protection and Nuclear Safety (IPSN) carried out research in all these domains in collaboration with other scientific organizations and universities. IPSN was leader although it was not in charge of the radiation protection of the public, which is the task of the Office for Protection against Ionizing Radiation (OPRI). Consequently IPSN became deeply involved in radon expertise. These research collaborations resulted in a network of researchers able to respond to diverse requests. This network is an asset in contrast with the "mad cow" disease and the HIV-contaminated blood situations where experts organized themselves only when the risk came on the public stage.

The informational action

Researchers participate in, even if they do not create, the movement which raises the alert regarding the risk of radon. As it happened, the alert about radon was essentially spontaneous. Scientists were then transformed into experts to make a scientific ruling and the alert thus marked the first step towards expertise.

The alert about the risk of radon was first an informational action addressed to the local managers and health engineers (1) and to professionals (architects, builders, real estate lawyers, etc.) (2). For the general public, information actions aimed first to make people conscious of the risk, and second to develop people voluntary actions towards the measurement and reduction of radon. Epidemiologic findings and the estimation of the risk associated with residential exposure were communicated (3, 4). Governmental departments were also informed first by OPRI (5) and then by IPSN which gave out its own position (6). The high point of the alert came in February 1998 with the national conference "Residential exposure to radon: risk assessment and risk management" where the various organizations involved stated the "interest of action" on the issue of radon.

1.2. A DUAL DEMAND FOR EXPERTISE

Unlike research aimed at establishing knowledge, expertise can "sift" and synthesize knowledge in order to provide an opinion. The advice requested by the authorities, by any other institution or even by individuals, is sought from qualified scientists. The call for expert advice is dual.

Extensive requests for in-the-field expertise

The request for an operational expertise concerns practical cases, usually linked to high radon concentrations. It comes principally from local city governments in charge of public buildings (schools, etc.). Expertise is directed towards the diagnosis of the sources and paths of entry of radon, the proposal and implementation of remedial measures, and the verification of the permanence of the remedial work undertaken. The expertise is often carried out on an adversarial basis, with arguments and counter-arguments, especially at the diagnostic stage.

The request for expertise also comes from the media (newspapers, TV and others). The first expertises took place in quiet contexts, with citizens barely reacting to the results of their home's radon concentrations. The situation is now reversing because of the cases involving schools which constitute a sensible point for the public.

The courts are another area where expertise may be requested. A few lawsuits associated with contaminated sites, that is, when the radon is not of natural origin, which is a particular case, have been set up. One example is the radon contaminated school Marie-Curie in Nogent sur Marne: after a complaint was filed against John Doe by a mother in May 1996, the expert appointed by the prosecutor recommended measurements to locate radium waste products.

Request for expertise by the government

Counsel to the government for regulatory decision-making is another form of expertise. The government seeks advice before the decision is made. The experts' advice is generally provided in the course of a formal procedure. Concerning radon, the governmental request for expertise is fairly recent.

In September 1996, an ad hoc working group of experts for the "management of radon risk in homes and in buildings open to the public" was set up by the Ministry of Health. In its report in July 1997 (7), the group proposed three levels, each involving a different type of action; and in particular action was recommended when the indoor radon concentration exceeds 400 Bq.m^{-3} .

Afterwards came the French Superior Council of Public Health (CSHPF) which is a scientific and technical advisory body, reporting to the Minister of Health. It must be consulted about most texts drawn up by health officials and, on its own motion, provides opinions. It has also the freedom "to *examine all scientific or technical question related to human health, about which it finds it necessary to alert the government*". In an opinion published in May 1998 (8), the Council stated that "*epidemiologic studies do not permit the issuance of recommendations with an irrefutable scientific basis*" and did not consider radon to be "*a priority public health problem*"; it proposed only an action level for buildings open to the public, of $1\ 000 \text{ Bq.m}^{-3}$.

A different approach was taken by the Committee for Prevention and the implementation of the Precautionary Principle (CPP). Created recently (1996), the CPP reports to the Minister of the Environment and has a mission of watch, alert, and expertise on environmental health issues. In a recommendation on radon made in 1997 (9), firmly based on the precautionary principle, the CPP considered "*the existence of lung cancer risks associated with mean annual exposure to concentrations exceeding 400 Bq.m^{-3} ... as plausible even if it is not totally established by direct epidemiologic proof*" and called for application in France of the European recommendation (10), which calls for action to be taken at a threshold of 400 Bq.m^{-3} for an existing dwelling.

The divergences between these two bodies, the CSHPF and the CPP, illustrate different approaches to interpreting the precautionary principle: the absence of irrefutable scientific proofs led CSHPF to relegate radon to the ranks of non-priority risks, whereas, for CPP, enough proofs exist to implement actions in conformity with the European recommendation. They are equally revealing of the difficulties involved in managing radon risk: can the State act in the private sphere about a household risk? The CSHPF probably answered this question in the negative, when proposing action only in buildings open to the public.

Whatever the recommendations are, the Ministry of Health is free to accept or reject them. The expertise furnished has not yet had a result, in terms of a decision applicable to all buildings. The Ministry of Health nonetheless issued a press release on the eve of the February 1998 radon conference in which an action level of $1\ 000 \text{ Bq.m}^{-3}$ and an objective of precaution of 400 Bq.m^{-3} were envisaged. This position provides guidance to the experts but complicates their tasks, for this position does not correspond to the action levels cited in the European recommendation, which were the goals aimed at before 1998. These levels were later formalized in an administrative note only applying to buildings open to the public, mainly schools (11) : simple remedial measures must be implemented when indoor radon concentration is above 400 Bq.m^{-3} and more extensive remediation

including closure of the building must be achieved when it exceeds 1 000 Bq.m⁻³. Private homes are still not covered by any regulations.

2. LEGAL UNCERTAINTIES RESULTING FROM THE LAG BETWEEN REGULATORY ACTIVITY AND EXPERT ACTIVITY

Many legal questions are raised by expertise provided in the domain of health and environmental risks, especially in absence of a well-defined status for scientific expertise. For example, in the case of asbestos, where scientific experts are suspected of collusion with industry (litigation is under way), the legal issues deal with the organization of the expertise intended for governmental use. Particular attention is being paid to the principles of full and free argument and counter-argument in scientific debate, of the experts' independence, and of the objectivity of the opinions they offer, which must take into account the relevant uncertainties. These issues are relevant to radon expertise but other issues are more pressing, in view of the lag between regulatory activity and expert activity. This lag raises legal uncertainties which concern damage to the legitimacy of experts and the possible imposition of legal responsibility.

2.1. DAMAGE TO THE LEGITIMACY OF EXPERTS

The expert's legitimacy

The question of the expert's legitimacy must be considered when dealing with vague requests for expertise. The lack of precision may be related to the content of the request made by the government, which nonetheless clearly requests an opinion: does the content concern dose estimates, risk assessments, or actions to be taken? The lack of precision can also arise from the procedure, when the distinction between the advice provided by the experts to the government and the government's position is not sufficiently explicit. The line between an expert providing advice and a decision-maker is sometimes difficult to draw, and their reciprocal duties hard to untangle.

This situation occurred during the publicized case of the Marie-Curie School in Nogent sur Marne. An article in a newsmagazine (12 March 1998), entitled "*Radioactive school: whose fault is it?*", summarized the outlines of a report by the Ministry of Health about the procedure for dealing with the users of school premises. The magazine stated that the report was drafted in collaboration with experts and reported the criticism of one member of Parliament to the comparison of doses of school users with the limits applying to nuclear industry workers: "*The least one can do is to keep all the experts who participated in writing the Marie-Curie report from touching any other radiation protection issue*". Even if this type of reproach is not accompanied by any justification to support it, it creates a risk to the expert's reputation. In a way, the expert is discredited morally in public and professionally in front of his peers and his employer.

Experts are also vulnerable in their relations with the media. Researchers' usual communication practices are totally upset when they function as experts (12). In this new setting, they are confronted directly by the media, without a safety net, so to speak. Let us see an example. During the radon measurement campaign, when high concentrations are found, rapid action must be taken to verify the first measurement and, if it is confirmed, to inform the resident about the remedial actions to be taken. However, the logic of rapid information to the public and homeowners has difficulty in respecting the rigorous methodology of expertise and the time necessary for its implementation. Moreover, the media often inform the public before the necessary second confirmatory measurements have taken place. Experts are then called upon to give both the public and the person concerned an opinion about unverified information; they find themselves in a situation that prevents them from acting as they think most ethical.

Collective legitimacy of experts contested in their exercise of the duty of alert

The informational actions by IPSN have called forth reaction from the government in a parliamentary report analyzing the French radiation protection system (13): "*The example of radon illustrates this point. IPSN has recently appropriated to itself the issue of radon, which has only a historic relation to nuclear energy (the uranium mines). This is a public health risk only. The problem is complicated by the fact that IPSN wants to give this subject an alarmist 'style', very different than that chosen by OPRI until now.*" Again, it is appropriate to wonder if such criticism portend legal risks. The first criticism deals with the so-called appropriation by IPSN of a subject that is claimed not to be within its scope. To our knowledge this type of incompetence is mainly sanctioned in administrative law. In these rules, incompetence is the making of an administrative decision by an

authority who lacks the legal capacity to do so and who encroaches on the jurisdiction of another authority. Incompetence is a basis for annulling a decision, unless exceptional circumstances (including the failure to act of the competent authority) justify a decision by the incompetent authority in lieu of the authority who was competent. The application of these administrative law rules to scientific expertise is not self-evident, even if experts could be regarded as temporary agents of the government. Moreover, IPSN does not function according to such rules, and the appropriation complained of is not characterized by the making of administration decisions.

The criticism above also puts forward the allegedly excessive nature of the alert. Experts could be reproached if this excess led to measures which would be prejudicial to someone (for instance, homeowners) from an economic or even psychological point of view. In such a case, the judge would have to decide whether these measures, implemented to protect against a risk that later was found to be overestimated, were proportionate to the state of scientific knowledge at the time, and it will have to do so following the logic of the precautionary principle.

2.2. THE POSSIBILITY FOR THE EXPERTS TO BE LEGALLY RESPONSIBLE

The contours of the duty of providing an in-the-field information

Because the government has not yet adopted an official policy concerning radon in homes, experts have progressively been called upon to furnish 'in-the-field' advice to local authorities and private citizens with whom they are in a direct relationship. They do so when collaborating with the local civil services of the Ministry of Health. In this situation, legal difficulties could arise regarding the conditions under which information is furnished to individuals. The administrative documents related to the national radon measurement campaign (14) provide that the transmission of individual results was the responsibility of the local civil services, with the support of documents certified by IPSN. In the case of elevated results, the protocol foresees a second, verification measurement. If that confirms the result, IPSN is to ensure that the individual was informed and that appropriate advice, relative to the health risk and the possible remedial measures, be furnished via the health engineers. Although this framework works well in normal situations, the slowness inherent in administrative decision-making sometimes means that the second measurement cannot be taken rapidly and the individual warned rapidly. In such a case, does an obligation to furnish information about the result weigh upon the IPSN expert ?

The basic elements in tort law are the occurrence of damage, a wrongful act or an investitive fact, and a causal link between the two. Questions are: what damage was caused? Is the failure to provide information about the result of the measurement at the origin of the alleged health harm? It is not certain that the health damage from radon exposure is aggravated by the failure to furnish the information rapidly, especially for exposure during several years. To characterize the defect of the information, the judge would consider the behavior of a conscientious and prudent expert from whom due diligence is expected.

The failure to furnish information can be analyzed as an act or error of nonfeasance (defined in articles 1382 and 1383 of the French Civil Code) engaging the liability of its author if there was a duty or obligation to perform this act – a duty in virtue of a legal, regulatory, contractual, or professional obligation. As indicated above, there are currently no rules governing the management of the radon risk, beyond the letter cited above (14), which places the obligation to inform individuals on the local civil services. It is therefore the local civil services that may be liable, according to the laws of administrative liability. Nonetheless, obligations binding the experts may arise from other sources of law. The code of medical ethics, for example; physicians are required to furnish to "*the person whom they are advising information that is fair, clear, and appropriate about his or her condition, the tests and care proposed*". The applicability of this text is questionable because the physician-experts who intervene in radon cases do so not as physicians but as engineers. It should also be noted that most often, a plaintiff would seek to hold liable under the doctrine of *respondeat superior* the employer, as such, rather than the expert himself. This responsibility for the fault of another is the rule for employer-employee relations, when the employee's act causes damage to a third party, except in the case of personal misconduct, separable from his work function. In the case of radon, the acts of expertise do not seem to be performed in an individual capacity but in the name of IPSN; these acts were thus performed as part of the duties assigned by the employer. Nonetheless, some ambiguity remains, for the experts are often solicited for their personal knowledge and skills, that is, *intuitus personae*.

As to criminal responsibility, the situation described above does not seem to include behavior that could be defined as a violation of any sections of the penal code. There is, of course, in France, the offense of non-assistance to a person in danger (Article 223-6 of the new Penal Code), but this offense is not made out unless the

danger, ascertained and not simply presumed, is grave, imminent, and requires immediate intervention. Radon exposure, even to high concentrations, does not appear to meet these criteria; the risk of lung cancer associated with radon has been shown only for cumulative exposure over a long period.

Does the absence of government regulation concerning radon in homes create a special responsibility for scientists?

To what extent must the State's lack of action be compensated by the action of scientists? What legal risks do they run? As seen, radon experts have fulfilled their role of alerting the government in diffusing knowledge. Ought they continue until the government issues regulations concerning all buildings? Such questions are not insignificant, in view of the outcome of the "contaminated blood" affair: officials at the Ministry of Health have been held criminally responsible because they did not prevent the commission of the offense of fraud in not tirelessly attempting to obtain the recall of blood products.

It is relatively difficult, in the case of radon, to describe an offense that has not yet happened, that may occur, and to try to determine the legal blame that would be incurred. This is especially true since, as of now in France, there are no precedents in this area of the responsibility of scientific experts. As G. MARTIN wrote, "*in criminal law, responsibility is still linked with power, more than with knowledge*" (15). It is nonetheless true that the attribution of blame and penal responsibility in public life is an increasingly trend that may affect those who participate before or "upstream" from public decisions, i.e. experts who possess knowledge of the risk. Facing this trend, the judicial system is somewhat taken aback, and some magistrates protest against the fact that the judge becomes the arbitrator of these "unseizable" responsibilities.

CONCLUSION

From a legal point of view, radon is a prospective case raising more questions than it resolves. Rules governing expertise are nearly non-existent in France: it would be wise to organize the transition period preceding governmental regulation of the risk, to deal with the expression, channeling, and evolution of expertise in an uncertain scientific and regulatory climate. A more solid framework including a redefinition of the links between experts and authorities, or even a statute of expertise could do much to compensate for the uncertainty inherent to any emerging field of expertise and to the beginning of any risk management policy.

Although consideration of such a status and procedures appropriate to scientific expertise is now underway, based upon the model of legal expertise (16, 17), there remain shadowy areas that escape the current analysis. Specifically, these proposals deal with the issue of expertise requested by the government for decision-aiding purposes, but do not consider the case of expertise furnished when the government has not fully acted. These involve operational expertise; they are no longer aimed only at advising decision-makers about preventing risk, but at action in the field to reduce exposure to the risk. Corresponding to this risk, whose uncertain scale makes it difficult to manage, is the legal risk that is also difficult for experts to detect. Experts tread uncomfortably the narrow space between not denouncing a risk and excessive alarmism.

REFERENCES

1. GAMBARD J.P. et *al.*, Campagne nationale de mesure du radon dans les habitations, note IPSN/SEGR/LEADS-97/n° 17, 1997.
2. ROBE M.C. et *al.*, Techniques de réduction du radon dans les bâtiments, quelques cas concrets, rapport IPSN/DPRE, n° 97-36, 1997.
3. IPSN, Maîtrise du risque dû au radon dans l'habitat, opinion synthétique du DPHD, rapport IPSN/DPHD/97-03, août 1997.
4. METIVIER H. et *al.*, Le radon, de l'environnement à l'homme, collection EDP Sciences, les Ulis, 1998.
5. OPRI, Lutte contre l'habitat rendu insalubre pour cause d'excès du radon 222, ZETTWOOG P., OPRI, 1996.
6. IPSN, Le radon dans les bâtiments, rapport IPSN/97-04, déc.1997.
7. DGS, La gestion du risque radon dans les habitations et les bâtiments ouverts au public, rapport du groupe de travail, bureau de la radioprotection, ministère de l'Emploi et de la Solidarité, juillet 1997.
8. CSHPF, Avis sur le radon dans les habitations et les établissements recevant du public, Bulletin Officiel du ministère de l'Emploi et de la Solidarité, 12 mai 1998.
9. Comité de la Prévention et de la Précaution, Recommandation sur le radon, ministère chargé de l'Environnement, mai 1997.

10. EURATOM, Recommandation de la Commission 90/143/EURATOM du 21 février 1990, JOCE n° L 80 du 27 mars 1990, pp 26-28.
11. Circulaire DGS/DGUHC n° 99/46 relative à l'organisation de la gestion liée au radon, secrétariats d'Etat à la Santé et au Logement, Paris, 27 janvier 1999.
12. DUBY G., L'expertise scientifique : une nouvelle mission pour les chercheurs et les organismes ?, Annales des Mines, pp 80-85, janvier 1998.
13. LE DEAUT J.Y., Rapport sur le système français de radioprotection, Office parlementaire d'évaluation des choix scientifiques et technologiques, 1998.
14. DGS, lettre DGS/PGE/1.B/n° 51 aux préfets en date du 14.01.1992, ayant pour objet la cartographie du radon sur le territoire français et la collaboration DDASS-IPSN, ministère chargé de la santé, 1992.
15. MARTIN G, Expertise et responsabilité juridique, in : Prévenir les risques : de quoi les experts sont-ils responsables ?, Editions de l'Aube, Paris, 1998.
16. HERMITTE M.A., L'expertise scientifique à finalité politique, réflexions sur l'organisation et la responsabilité des experts, Justices n° 8, oct.-déc.1997.
17. DECROP G.et *al.*, Prévenir les risques : de quoi les experts sont-ils responsables ?, Editions de l'Aube, Paris, 1998.