
The building of a Pluralist Expertise Group about uranium mines in Limousin (France)

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Abstract:

Uranium mining and milling industry once played a major strategic and economic role in France. After the definitive cessation of mining and milling activity in 2001, more than 200 sites are currently under closure and post-closure phases. Decisions required in this frame raise particular difficulties because of the sensitivity of some technical issues and the strong scrutiny and requirements of local and national NGOs. This is particular true in Limousin, the region that stands for the cradle and the heart of the national uranium history. In order to deal with this complex and disputed topic, the ministries of environment, health and industry recently decided to set up a pluralist expertise group with the aim to come to analyze and give a critical point of view on the various technical documents prepared by AREVA NC about the surveillance and control of its mining sites in the department of Haute-Vienne in the Limousin region and then provide recommendations to public authorities to improve current situation.

1 THE CONTEXT

1.1.1 Historical perspective

Uranium exploration and exploitation started in France soon after the end of 2nd world war. It gradually grew in importance from this period to the 80s. From the end of the 80s, it then rapidly declined under the combined effect of exhaustion of reserves and fall of uranium market prices. Activity came to a definitive end with the closure of the last mine in 2001.

During more than 50 years, more than 200 sites scattered over a large part of national territory where prospected and put in production. Most of them and at least the most significant ones in terms of quantity of uranium produced are localized in four main districts: le Limousin in the western part of the Massif Central, la Vendée in the west of France, l'Hérault in the South of the country and le Forez in the eastern part of the Massif Central.

French sites yielded a total of 76 000 tons of uranium which represent more than 10 years of the current needs of the national power plants. The milling of ores involved the operation of 8 uranium processing plants and produced more than 50 000 000 tons of tailings. These tailings are disposed in 17 specific repositories.

Closure works are now completed at most sites and remaining activity mainly consists in surveillance and control and in the maintenance of several water treatment facilities.

1.1.2 Particular place of Limousin region

Among the various districts that contributed to french uranium production, Limousin region clearly played a particular role. Limousin is indeed the cradle of the national uranium history: it was on its territory that the first exploited ores was found in 1946. It was on its territory too that the last mine closed in 2001.

Limousin region also played a leading position all along the 50 years of activity. It yielded nearly one third of the total national production and hosts 5 of the 18 tailings repositories (that represent roughly half of the total mass of tailings produced). On of its former mining site also hosts a storage facility for depleted uranium produced by the French fuel cycle facilities.

Limousin region witnessed several of the media crises experienced by the French uranium mining industry. It also hosted the first prosecution of a nuclear operator before a criminal court after a judicial inquiry was initiated against AREVA for "pollution, abandonment and dumping of waste containing radioactive substances" at several sites located close to old uranium mines in the Haute-Vienne department.

2 STACKHOLDERS POSITIONS AND EXPECTATIONS

2.1 AREVA NC

Following the merging and acquiring of the different companies involved in the exploitation of uranium ores, AREVA NC (formerly well known as COGEMA) has become the only industrial actor in this sector in France. Practically, it is now responsible for the management, monitoring and surveillance of the roundly 200 sites mentioned earlier.

Uranium mining is still in the core of AREVA industrial activities, production is however nowadays entirely located abroad. In France, practical involvement of the group on the former mining districts consists of addressing social and environmental legacy. From this point of view, sites can be considered as a burden; the question is then raised of how the sites can be definitively closed and relieved from regulatory control. In other words, background question is how to sell out this legacy and quit the game.

From another point of view, social and environment legacy is also a potential threat to AREVA's image as a sustainable company. This aspect is all the more significant that aside its mining activity AREVA group is also one of the major company in the nuclear business both in France and worldwide. As a nuclear actor it is at the center of a strict scrutiny from various stakeholders including environmental NGOs but also politicians and media. This context spurs AREVA to fully respect its duties and even act in a proactive manner.

2.2 National and local NGOs

Concerns and interests of NGOs in the former uranium mines find their roots on the one hand in the willing to defend local quality of life and environmental protection and on the other hand in an attempt to stress the failures of an industrial actor considered as a member of the "nuclear lobby" and this way to shift to a general debate about nuclear energy.

Uranium mining is thus often pointed out today as the weak point of the nuclear industry. It is notably acknowledged to account for the largest part of public exposure due to fuel cycle

facilities, far behind the exposure usually attributed to nuclear power plants or even spent fuel reprocessing. Moreover the management of uranium mining and milling waste and particularly the long-term safety issues associated with the 17 tailings repositories and the 50 million tons they contain has found a natural place in the national debate about nuclear waste and the most adequate national frame to regulate and control nuclear activity.

Not surprisingly, the topic has progressively become a particular topic of concern and interest for national NGOs involved in the world of radioactivity.

In addition to this general context, the last decades of the French uranium mining history knew a series of local disputes between NGOs and AREVA. These disputes that eventually came to media or even judicial field globally contributed to raise suspicion and weaken the trust of local populations towards AREVA.

Transport and disposal of wastes coming from other regions, others steps of nuclear cycle or other TENORM industries were at several occasions denounced as unfair and unacceptable practices. They were considered as an attempt by mining companies to take benefit of too fuzzy regulations and too accommodating enforcement of laws to convert old mining sites into national nuclear waste disposals.

In parallel, NGOs (along with official reports written in answer to administrative bodies or parliamentary offices) challenged the regulatory status of several tailings repositories and argued they should be regulate as nuclear installations based on the total amount of activity they contained.

At last, several cases of enhanced levels of radioactivity in the vicinity of mining sites were pointed out as a proof of inadequate management of mining and milling wastes or inappropriate control and treatment of water discharges. Dissemination of spent rocks (or very low grade ores) and their reuse as construction materials were thus acknowledged to cause high radon concentrations (locally up to 10 000 Bq/m³) in an industrial building. In other places, the sediments of several ponds including a lake dedicated to recreational activity and ponds used to produce drinking water were found to present high concentrations in uranium.

2.3 Local populations

Former uranium mining districts are mostly located in low-populated areas, sites being themselves in countryside. Local populations are therefore mainly rural and uranium mining and milling were once a major source of wealth and employment. Social and economic impacts were therefore significant and expectations from AREVA NC to support new industrial development during a transition phase were high. More than 5 years since the last site closed and several decades after French uranium booming, this question is probably not as sharp today as in the past.

Concerns or at least questioning can nonetheless be locally strong about environmental impacts and their potential economic side-effects. Green-tourism indeed often plays a particular importance and could easily suffer from being associated with pollutions; especially if radioactive.

2.4 Local and national administrations

Several national administrations are involved in the old uranium mining issue. As any mining activity, the issue first falls under the responsibility of the ministry of industry and more

particularly of the department in charge of defining the guidance and regulations relative to the closure and post-closure management of mining sites. But it lies also in the liability of the ministry of ecology and sustainable development notably because tailings repositories are regulated as installation classified for environmental protection purposes. In this particular field, it played an active role in defining guidance for the control and surveillance of the sites concerned but also gave strong incentives to improve public information and promote independent review of AREVA NC reports. At last, the ministry of health and the nuclear safety authority is also involved in the issue through its general competence to propose nuclear policy and regulations.

At local levels, administrations struggle between the need that the post-closure works and administrative procedures may proceed forward and the claim from NGOs and local populations to get a clear statement about actual impacts on man and the environment before any decision to go further. One particular difficulty they encounter is linked to the accusation of being too accommodating towards AREVA NC launched by some NGOs.

3 THE ORIGIN OF THE PLURALIST EXPERTISE GROUP INITIATIVE

3.1 The GRNC experience and the opening up of IRSN expertise

In 1996, an epidemiologic study published in a scientific journal established the existence of a trend towards an excess number of leukemia in the canton of Beaumont-Hague, close to AREVA reprocessing plant. The study suggested a relation with the consumption of seafood and time spent on the beach and led public authorities to ask for a more detailed radioecological analysis in order to produce a direct and best estimate of the radiological exposure of the population and corresponding predicted effect on health.

Annie Sugier, director of radiation protection at IRSN (formerly IPSN), was commissioned to form and preside over the group of experts in charge of carrying out this work. The group, known as the “Nord-Cotention radioecology group” (GRNC) included experts from a wide range of origins (inspectors, operators, governmental experts, experts from non-governmental laboratories as well as foreign experts). After 2 years of work it addressed its conclusions to the ministers of environment and health and closed a first phase of analysis by issuing a series of detailed reports now considered as reference documents.

This rather unique experience in France really marks the beginning of a resolute IRSN strategy to open up its expertise to civilian society in order to deal with complex or disputed topics. This approach to involve the interested parties is largely consistent with the guideline adopted by the French government for greater transparency in the field of nuclear and radiological risk management.

3.2 The GEP mines: origin and organization

Following the GRNC experience, a discussion was initiated between IRSN and interested public administrations to engage a new initiative of pluralist expertise about potentially interesting topics including the question of old uranium mines. This proposal raised interest from the 3 competent administrative bodies in charge of this latter issue: the ministry of ecology and sustainable development, the ministry of industry and the ministry of health. Practically it led to two different initiatives: one from the local administration in charge of regulating the sites, another from national administrative bodies.

At local level, the prefect of Haute-Vienne requested AREVA NC to prepare a ten-year environmental report about the surveillance and control of mining sites located in the department. This report was issued in the end of 2004¹. In order to get an expert opinion about its content the prefect then asked AREVA NC to produce an independent review of the report with the aim to give a particular focus on 5 different topics:

- the sufficiency of the closure and post-closure works already done on the sites regarding middle and long-term radiological safety issues;
- the assessment of environmental impacts associated to mining activities, especially those linked to water discharges, and the sufficiency of solutions implemented by AREVA to prevent and limit them;
- the adequacy of radiological calculations done by AREVA NC to evaluate the added exposure received by populations living around the sites;
- the soundness of control and surveillance provisions with regard to the occurrence of enhanced levels of radioactivity in specific compartments of the environment;
- the potential dissemination and use of mining and milling wastes for private or public works.

IRSN has been entrusted to carry out the corresponding review.

At the national level, the 3 ministers asked Annie Sugier to form and preside over a new pluralist expertise group aimed to analyze and give a critical point of view on the various technical documents prepared by AREVA NC about the surveillance and control of its mining sites in the department of Haute-Vienne in the Limousin region. One particular document is the ten-year environmental report mentioned above.

According to the mandate given to the group, one particular expected output is to assist public authorities to identify the available options for post-closure plans and to provide recommendations on the possible solutions to minimize existing impacts on the environment and the local populations.

In order to fulfill these objectives, the group is expected to carry out its own work but also to steer and take benefit of the review of the AREVA NC ten-year environmental report entrusted to IRSN.

After necessary consultations of local and national administrations, potential experts but also main stakeholders (including leading national and local NGOs), a list of a dozen of members was established and a first meeting was organized late June 2006. Scientific backgrounds of the members of the expert group relate to earth sciences (hydrogeology, geochemistry, mining), metrology of environmental radioactivity, radioecology and radiation protection. The group includes experts from French public organizations but also foreign experts, experts from non-governmental organizations and representatives from AREVA NC.

Following the first meeting, the experts decided to form three working groups each dedicated to a specific topic. The first one deals with source-term, discharges and transfer to the environment. It aims to review the main processes involved and the way AREVA NC took them into account in its studies and reports. The second working group deals with environmental and health impacts. The group examines the approach handled by AREVA NC to evaluate impacts to man and the environment around its sites but also aims at providing guidance on the need and feasibility of setting up health surveillance provisions to complement the dose assessments currently carried out by AREVA NC. The third group intends to provide a broader view to the expertise work by addressing the question of

¹ see extended summary available on the web site of the DRIRE Limousin
<http://www.limousin.drire.gouv.fr/environnement/cogema/BILANDECENNALENVIRONNEMENTALRESUME/resume-BDE.pdf>

regulatory framework and adequate requirements to ensure health and environmental surveillance today and in a long-term perspective. In a first step work is focused on the analysis of the many public reports dedicated to this issue.

4 TECHNICAL QUESTIONS AND NON TECHNICAL EXPECTATIONS

Contrarily to GRNC or other international initiatives dedicated to old mining sites, the question addressed by GEP mines is not heavily focused on one single sharp technical issue. It is rather a combination of many concerns, stakes and objectives that end up with a complex and disputed situation. Among this complexity and diversity of issues a few can be stressed as key questions.

From a technical point of view, these key questions generally relates to the evaluation of an added dose in a context of natural radioactive background, to the occurrence of locally enhanced concentrations of radioactivity in the environment and their potential impacts on man and biota and to the necessary provisions to ensure long-term safety especially as far as tailings repository are concerned.

Previous questions are quite generic and have already been addressed in a theoretical (and sometimes practical) way at different occasions by international organizations and a few foreign countries. In the case of the GEP mines they have to be tackled in a particular context where technical positions supported by AREVA NC and sometimes regulatory practices have been challenged by local and national NGOs and a climate of mistrust has progressively settled. This clearly requires a particular care to hear and understand various opinions and concerns and to properly inform and explain technical positions that will be taken. This information and explanations are not only required to the administrations that initiated the creation of the expertise group but also to the various other stakeholders. In order to more fully answer to these expectations, the 3^d working group has decided to enlarge its composition to more closely involve the various points of view expressed in the successive debates including judicial ones.

In addition, GEP mines must contribute to the expectations of public authorities by providing practical guidance to proceed with closure and post-closure administrative procedures in a way widely discussed and accepted.

Given the many different sites and situations to cope with, both IRSN and GEP mines decided to first focus their technical work on two specific issues. One is related to the tailings repository of Bellezane, the other to the environmental impact at the scale of the watershed of a local stream called Ritord. The expertise about Bellezane repository has notably addressed the question of hydraulic functioning of the disposal system and the potential existence of leakages; it has also assessed the efficiency of the waste rocks cover with regard to the attenuation of external gamma dose rates and radon exhalation rates. The expertise about Ritord watershed has assessed the question of the origin and evolution of the sediments enhanced uranium concentrations (up to several 10 000 Bq/kg⁻¹) measured in the estuary of the stream into an artificial lake. It has also examined the information available to evaluate the potential impact of mining activities to species and biota.

After nearly 6 months of work, GEP mines intends to deliver a first interim report at the end of this year. This interim report will provide some technical insights about the two specific issues mentioned before and define the roadmap for the continuation of the work.