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Report

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Nuclear Wastes Management: The Lessons from the CSM Disposal Site (Centre de Stockage de la Manche)

Memory-less Centre,
Future-less Centre?

*Realized for Greenpeace France
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Preamble

At the very same time that a short-term legislation is planned regarding nuclear material and wastes management in France, without taking into account the results of the few citizens' consultation done so far, it is normal to be concerned.

Respectful of the statutory vocations of each organization, and mindful of their concerns in this field and their respective competence, Greenpeace France has solicited the ACRO to obtain an informative contribution on the question of wastes at a crucial time in regard to the 1991 Bataille legislation.

In response, the ACRO offered a critical analysis, not actually of the technical or social aspects of this trade, but of a particular case : the storage as it was practiced in the first and most important site of Europe, that is the CSM Disposal Site (Centre de Stockage de la Manche). The ambition of this analysis is to give the public elements of understanging regarding the issue of radioactive wastes disposal in France.

For 20 years, the Association for the Control of radioactivity in the West (ACRO) has concentrated on the question of what radioactive wastes were to become, and especially on the problems of safety and pollution for the environment which the storage on the Cogema – la Hague and CSM sites might have caused. Along the years, its volunteers' commitment, some of whom live in the concerned region, in the institutional commissions and work groups, but also in the follow up of the radioactive contamination of the ecosystems, enabled the ACRO to acquire a « certain » knowledge of the wastes sposal activities and their impact. Nevertheless, this knowledge will never compare with that of the nuclear fieldworkers. There is a disproportion of means, the ACRO cannot mobilize the same technical, human and material resources, and all the relevent data is not accessible, including within the commission we participate in, as shown by some anonymous documents we receive.

With its 527 217 m³ of low and medium activity wastes put in storage between 1969 and 1994, the CSM is and remains to this day a necessary element to understand the problems posed by the eternal storage of nuclear materials and the limits of the notion of reversibility. There are therefore teachings to be drawn. We cannot repeat past mistakes in particular with high activity wastes which we wish to bury deep underground : out of sight, out of mind.

This repport is based on the analysis of the existing bibliography, of the internal ANDRA documents which we released to the public, of the lessons drawn from our participation in the official concertation and work groups, and finally of the data obtained after inquiries were done in the region in the framework of RIVIERE (Réseau cItoyen de Veille, d'Information et d'Evaluation RadioEcologique / Citizens Network of RadioEcological Surveillance, Information and Evaluation).

In spite of all the efforts produced, many questions remain unanswered regarding this site so it is sometimes difficult to be more precise.

Synthesis : the lessons from the CSM disposal site (Centre de Stockage de la Manche)

"The past was dead and the future unconceivable" George Orwell, 1984

For the CEA, which was responsible for it during all its active phase, "the CSM site, after twenty-five years of good and faithful services, has now become an international reference regarding the techniques of wastes disposal." As the future of French nuclear wastes is currently being debated, we find important to draw the lessons from the management of this site.

Because the storage preceded the regulations in that field, the site is no longer satisfactory in regard to the current surface disposal standards. All sorts of things were disposed of and stored there, on the ridge of ground water and without any weather protection. Regarding the older wastes, the inventory was of the most whimsical kind and very likely bellow reality. But the most serious part is that the CEA sites have rapidly ridden themselves of embarrassing wastes before the regulations became stronger. The Turpin Commission has shown evidence of this fact in the case of plutonium. This crime committed knowingly is very shocking because the knowledge implying procedures revision was elaborated in the very same organization. Over 10% of the volume stored in the site is of foreign origins, in spite of a French law forbidding this practice.

Due to the large amount of long life elements and the toxic chemicals it contains, the CSM will never go back to the ordinary and it will remain forever. Its status is therefore distinct from that of the CSA (which only receives wastes material selected according to strict criteria); it is actually closer to what could be an underground disposal site supposed to receive, far from sight, all the embarrassing wastes. The geological barrier only delays slightly the surfacing of problems.

Because of its empirical management, it is causing damage to the environment. Consequently to the repeating incidents which added up to a constant and diffuse release, the ground water and many outlets are highly contaminated with tritium. We must note that for a long time there was a lack of information regarding this chronic pollution, and even now a precise assessment of its impacts still needs to be done. As far as the situation, it could worsen in the long run because there is no guaranty that the wrappings of the older wastes, which also contain more hazardous elements, will last for such long periods of time. When a new contamination is detected it will be too late.

In spite of this, there is no dismantling plan of the site, not even a partial one. The argument generally put forward, besides the economic costs of the operation, is the health risks posed by the operation which would be greater than the risks related to its impact on the environment. On top of it, there is no other solution for the extracted wastes which should not be accepted by the CSA. It is therefore more comfortable for the nuclear officials and the public authorities to consider this matter settled.

How then can this center be given in heritage to the future generations ?

How will memory be transmitted if even our generation does not know exactly anymore what is in it ?

Above all, how can we give them the possibility of an opinion regarding their future which would be different from that which is currently underway ?

These fundamental questions must be considered for all the other radioactive wastes.

The CSM exemple shows us how vain a long term passive management based on forgetting is. The supposed reversability of the forecoming storage is only delaying for a few generations the shutting down dilemma, without solving it.

The protection of the future generations draws consensus when discussing the management of nuclear wastes. But when it is about the current generation, the consensus vanishes... The public is absent from the waste management legislation project presented by the government, which ignores the public consultation it ordered. Now, if the CSM is a memory-less center, it is because the management was done behind closed doors and it is important not to repeat this.

The well-being of the future generations, for whom the wastes management must be limited, therefore often appears as a thoughtless reflection used to make anything pass. Leaving them means of action implies keeping the memory of this burden alive. Historical examples show that it is because of the redundancy of information preserved under different shapes that it was possible to transmit it from generation to generation, despite unknown factors. Therefore there is a moral obligation to share the knowledge about nuclear wastes with the population. Unfortunately, the current nuclear debates have failed to mobilize crowds, because citizens had the impression that they were powerless in the decision-making process. Why get involved if the decisions have already been made ? Hence it is important to implement a democratization mechanism regarding wastes management, in order to insure its memory transmission.

The other element at stake is the transmission of a memory that would faithfully translate the inventory, which is not the case of the CSM. There again, there is a need for a democratization of the decision-making process, including more opening upstream which would give civil society enough time to appropriate the problematic. It is in this perspective that the ACRO has been working ever since its creation.

In conclusion, the safety of the future generations regarding nuclear wastes management implies a better governance in the current management, relying on a larger democracy. It would be a shame and a danger if the opportunity of the current legislation project was missed for another ten years. Even more so because unfortunately there is a considerable lateness to make up for and wastes like those at the CSM, of which the future is officially settled, still need to be addressed.

Summary of the 1st PART

The universe of the CSM Disposal Site (Centre de Stockage de la Manche)

The CSM Disposal Site was built in the Eastern part of the reprocessing plant of La Hague, in a place named the « High Marshes », a particular humid zone. This is undoubtedly the worst choice when knowing that water is safety's worst enemy. The first wastes were stored on the very ground, and then in concrete trenches, which were regularly flooded. Some of these structures were dismantled, others are still there, on the ridge of ground water. While the storage preceded the regulations in that field, the empiricism which led the construction of this site is already a source of concern which should worsen in the future.

The storage structures and the wastes quality evolved with time towards more rigour. But each strengthening of the legislation triggered a de-storing of the CEA sites during the previous years. This crime committed knowingly is very shocking because the knowledge implying procedures revision was elaborated in the very same organization. The ACRO had also denounced similar practices just before the closing down of the site in 1994. Nowadays, the CSM site contains many long life elements which are not accepted anymore at the CSA site which took over. There are, among other things, 100 kg of plutonium, as well as many other alpha emitting elements particularly toxic in case of contamination. If we add up the chemical toxics which will not disappear with time, including almost 20 tons of lead and one ton of mercury, the CSM site shall never go back to the ordinary. At the time of its closing down, the ANDRA shamelessly announced that this site could go back to nature after 300 years and that its coverage was definitive.

The inventory of the stored wastes is not precisely known. During the first years, the identification documents of the senders alone were enough. Storm erased part of this memory and the information about the first years are unreliable. Some of the storing structures too, and a part of the wastes escape the surveillance system that was set up. A retired ANDRA employee goes so far to evoke collapsing risks. In case of a problem, the ground waters will be hit and it will be too late. According to our estimations, over 10% of the 527 217 m³ of stored wastes are of foreign origin, in total violation of the French law. While the issue of shallow storage is officially considered as « settled », it is legitimate to wonder about the future of the CSM site. It is also necessary to draw the lessons from these setbacks for the other wastes waiting for a solution.

Without the associations' civil surveillance and the warning revelations of an anonymous whistle blower who sent some documents to the ACRO, the ANDRA plan would have been endorsed by the authorities. The pluralistic commission which led an inquiry following the ACRO revelations in 1995 estimated that this storage is irreversible. Based on a study by the ANDRA, it indeed estimates that getting the wastes back is unreasonable because of health and financial costs. Above all, there is no solution for a part of these wastes which should not be accepted by the CSA.

Environmental requirements have evolved along the 25 years of exploitation of the CSM site. These requirements should evolve even more on time scales involving several generations. The reversibility of storage is therefore a moral constraint following the precaution principle. It is generally thought of as a means to make projects more socially acceptable by the authorities. But reversibility is not just a technical problem and it should lead to rethink entirely the radioactive materials management in a democratic way. The option of a durable storage had the favor of the public during the national debate, but it was unfortunately ignored by the authorities which prefer a strategy based on oblivion.

The situation is the same for the CSM site. After the current phase of surveillance, a new cover is planned in order to switch to a more passive phase. The decision not to get back all or a part of the wastes is based on some ANDRA studies which received no detailed counter-assessment. We have, in vain, asked the surveillance commission of the site to promote the implementation of a pluralistic reflection which would have to consider the mentioned risks before making the decision to definitively close the site. This demand is particularly important to us before deciding to give the future generations such a threat in heritage.

Summary of the 2nd PART

The water pollution of the ecosystems by tritium

In the past, the river Sainte-Hélène which runs not far from the CSM disposal site contained cesium-137 in proportions 100 to 1000 times higher than in the other neighboring streams. This abnormality was paralleled with the presence of other fission products and high quantities of plutonium: the sediments contained more than 140 Bq/kg of plutonium-238, that is 5,000 times more than the river Rhône downstream from the Creys-Malville complex (Superphénix). The CSM was the source of it. Since then, the causes have been neutralized and there are only traces left of this massive former pollution.

But at all times tritium (radioactive hydrogen) was found on site. Today still, many rivers, aquifers, resurgences and wells are concerned.

Since the very opening of the site, large amounts of tritium were disposed of. In 6 small squares of the so-called TB2 structure, the equivalent of three, maybe 15, years of tritium wastes issued from the current electric nuclear park in a whole were stored. Estimations vary depending on the era, highlighting the lack of knowledge regarding waste contents.

But this tritium was not inclined to stay in place, and in October 1976 a massive contamination of ground and surface waters started. All which could be recaptured was, and the stored amounts were radically reduced.

This incident revealed, besides dysfunctions and an inappropriate storage procedure, the leaking of tritium through the containers and structures. This phenomenon, which started as soon as the first tritium wastes arrived, still exists today and will cease when there is no more tritium in the parcels.

Because the site manager refused to sufficiently protect the wastes from weather exposition during the 25 years of its exploitation, including while it was implementing solutions for the CSA site, the situation degraded in La Hague. The lixiviation of the wastes by rainwater considerably increased leaks.

The CSM has therefore always been "losing", and is still "losing" its tritium under other ways than radioactive decrease, a fundamental principle of nuclear waste elimination. The data analysis dated after 1986, which is the only data available, tends to suggest that at least 20% of the stored tritium may have "vanished" in the environment until now. In a memo dated 12/18/92, the manager even estimated *at 1,850 TBq [130% of the tritium inventory of the site (ndlr)] the activity lost in the ground following the 1976 incident.*

Liberated from the structures, this tritium mainly follows the natural water ways. It tends to reach the underlying aquifers but also the atmosphere. It is therefore destined to be "eliminated", one way or another, through dilution and spreading in nature.

During the year following the October '76 incident, the ground waters contamination could reach 600,000 Bq/L and that of the river Sainte-Hélène more than 10,000 Bq/L. It is considered that the worst is behind us. In 1983, an aquifer reached 6 million Bq/L! Experiment? Incident? Accident? The public and the neighboring population still do not know. Just as then, they do not know that "concerted" releases are being done in the river Sainte-Hélène, which led in October 1982 to a water contamination reaching 50,000 Bq/L.

After the last parcel was delivered, and the cover built, indicators then showed evidence of the beginning of an improvement process of the radiological quality of the underground waters.

Without any industrial leaks or unforeseen events, the water content in tritium must be around 1 Bq/L. From a health point of view, the WHO has considered since 1993 that water destined to human consumption should not contain more than 7,800 Bq/L in tritium. As regarding Europe, since 1998 it aims not to go over 100 Bq/L.

In 2005 the pollution is not yet resorbed. It has generally declined. Still, the contamination of controlled ground waters can still reach 190,000 Bq/L. And 20% of the contaminated aquifers do not show the expected reduction if we consider the radioactive decrease conjugated with the water renewal. Even stranger, some even tend to increase.

During all those years, the tritium pollution is becoming pervasive. It is geographically spreading onto the northern side. It reaches wells, resurgences and the main streams which run down the basin.

Currently, all streams (the Roteures, the Sainte-Hélène and the Grand Bel) have in common to be contaminated by tritium, at varying levels comprised between a dozen and several hundreds of becquerels per liter. Regarding the first two, the resurgences drain more contaminated waters along the first kilometer than in the stream at the same place. A few hundred meters downstream from the river Sainte-Hélène, one could measure in 2003 up to 700 Bq/L of tritium in a resurgence. And this situation is not in contrast with that which the ACRO measured a dozen years ago, this time at the foot of a family house. In the case of the river Grand Bel, polluted at the source, there again the tritium concentration in the waters has not evolved since 1994! It steadily remains between 750 ± 100 Bq/L at the source.

The observation of those last years brought up some questions. Why has the tritium contamination not radically declined as one could have expected, if we consider dilution conjugated with radioactive decrease? Even if we only consider the radioactive decrease, the levels should have decreased of 50% compared with 1994. Still, they

remain approximately the same in some points, which implies that the mobilized tritium has increased.

The resurgence and stream waters may not be directly used for human consumption, but they are for the cattle and even for the garden. In the case of a cow regularly given tritium-containing water to drink, transfers take place with the milk. They are confirmed in la Hague we refer to milk controls done by a nuclear operating structure other than the ANDRA, since the latter has not been doing any such controls since the beginning. And the results of the transfers do not stop there. The tritium, which is radioactive hydrogen, can be "exchanged" and enter the composition of organic material, therefore of life. Flesh, fat, vegetable, etc. may be concerned. The ways to affect man then multiply. But one would have to at least want to know about them.

Cleaning the water pollution of ecosystems is a moral necessity. It is unacceptable to watch the manager of a nuclear wastes disposal site resign when faced with a radioactive element such as tritium which he was not able to contain on site, and abandon it at the foot of houses, at the bottom of fields. It is necessary at the very least to study, as ACRO has been demanding, the possibility to use the recognized pumping method which consists in drawing from the ground water to discharge in the sea, in the hope to see a slow decline of surface waters contamination and to handle in a controlled and organized way the radioactivity movements towards the environment.

Putting it in perspective...



"The CSM site, after twenty-five years of good and faithful services, has now become an international reference regarding the techniques of wastes disposal [...]"
The CEA (Commissariat à l'Énergie Atomique, Découvertes Gallimard / CEA, 1995)



Storage in open ground



Fissured concreted hull

Transmitted anonymously, these pictures were taken inside the CSM disposal site during the exploitation phase