

Summary and Main Conclusions

EXTENSION OF THE MELOX PLANT: Successful 'blackmail' by COGEMA

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- **Presentation of the study and main conclusions**

Within the framework of the public inquiry on the extension of the capacity of the MELOX MOX production plant, operated by COGEMA at Marcoule, France, WISE-Paris has studied the contents of the extension request, and the context of the decision on extension.

The resulting report shows up that the COGEMA strategy of 'blackmail', to use the term employed a few years ago by the French nuclear safety authority, is close to success, in spite of the decline of the international plutonium industry. It examines several deficiencies in the decision-making process, based on an extremely limited public inquiry, and compares French practice with the more democratic procedures of Great Britain and the United States. Finally, the report includes a critical review of the public inquiry dossier, which appears globally incomplete and insufficiently detailed.

- **The context of the decision**

Study of the development of MELOX since the decision in principle, in 1985, and until the request for extension submitted to public inquiry in 2003, **reveals a long series of arbitrary decisions and of 'fait accompli'**.

The decision to build a major French MOX production facility at Marcoule—made in 1985 at the same time as the decision to extend the La Hague plants—had already a very fragile basis, and no economic justification. In 1989 —too late to reverse the decision—EDF established that reprocessing of spent fuel, and above all re-use of plutonium in the form of MOX, would lead to "*an important loss of competitiveness*".

The MELOX plant was nonetheless authorized in 1990, and began operation in 1994–95. As soon as 1996, COGEMA requested authorization to increase the plant's output by diversifying to satisfy foreign clients—and proceeded to build the corresponding production line without further delay. Its "creation" was authorized, without a public inquiry, in July 1999. However, the authorizing decree required COGEMA to diversify at constant capacity.

Diversification very rapidly provided the motive for new requests from COGEMA to increase its output. In particular, COGEMA justified its successive requests by the necessity to transfer production from the ATPu, the MOX production facility at Cadarache, to MELOX. The nuclear safety authority, which requested closure of the ATPu "*shortly after 2000*", qualified this reasoning as "*blackmail*", and remained committed to dissociating the two cases from the procedural point of view.

In the end, it was COGEMA's logic that carried the day: the request submitted in January 2003, for an extension of capacity to 145 tML, was presented, by the Government and by the Operator, as a simple transfer of production from Cadarache. The decision was made even though, more than three years after the date fixed by the authority, COGEMA had still not made any commitment to a date for full and final closure of the ATPu. Moreover, contracts for the ATPu (with Germany) only covered a few years of production; their transfer does not therefore justify by itself the unlimited extension over time of MELOX's production capacity.

Finally, the public inquiry began—at the same time as other crucial decisions to maintain the plutonium sector in France were being made—on the eve of the official announcement by the Government of a wide public debate on energy, to start in March 2003. A decision, affecting the fuel chain back-end, which constitutes one of the official topics of the public debate, therefore preceded that debate.

In an international context marked by the rapid decline in the plutonium sector, **the development of MELOX's production capacity does not appear justified by foreseeable outlets** for French MOX in other countries.

The 'market' for the MOX fuel is restricted to a very small number of producers and users. The commercial nuclear industry counts only three countries—Belgium, France and UK—producers of fuels using a mixture of uranium oxide and plutonium oxide, or MOX, for light-water reactors. And only four countries—Belgium, France, Germany and Switzerland—now use this fuel in their reactors.

In deciding to no longer reprocess spent fuel, Belgium and Germany have chosen to end the use of MOX fuel in the coming years; Switzerland is also envisaging the possibility. Conversely, no country is today showing a will to use MOX in its light-water reactors, with the notable exception of Japan, where the program has, however, been seriously compromised by a series of scandals, and the United States where the program is pursuing a very different objective of immobilizing surplus military plutonium.

France could, in the mid-term, find itself the only user of MOX for re-use of 'civilian' plutonium. The contract made between EDF and COGEMA, for a constant quantity of 100 tML per year, covers a period up to 2007, with an option to go to 2015. Developments in fuel management in EDF reactors, especially increased burn-up rate, are leading to reduction in the tonnages of MOX fuel needed.

EDF is using less MOX than is possible from regulatory and technical points of view. Whereas 28 of its reactors are technically able to use MOX, only 20 are authorized to do so, and what is more EDF is showing no intention of submitting applications for extension of the authorization to the remaining eight. Moreover, EDF does not use the maximum MOX load capacity of its reactors using the fuel—since the first MOX load in an EDF reactor, in 1987, the percentage of MOX contained in "moxed" reactors has been, on average, 23 per cent, instead of the 30 per cent authorized.

• Deficiencies in the decision-making process

The decision-making process for authorization of the extension of capacity at MELOX suffers from a number of inadequacies: absence of place given to a national debate; difficulties in access to information; and a somewhat undemocratic method of public inquiry. These problems are not specific to MELOX, but rather indicate the increasing inappropriateness of the procedures used in France to authorize industrial projects or development with regard to the way society is evolving. The question is however, especially acute where nuclear power is concerned, as the sector is subject to a whole series of specific and protective regulations.

The public inquiry mechanism issues from old procedures based on the model of inquiry into public utility, of which the object was the compulsory purchase of land required for development or construction projects. This form of consultation remains, by its nature, focused on problems that are extremely local, as demonstrated by the contents of the public inquiry dossier, and no space is given to public debate on the national issues inevitably associated with projects structuring the back-end management of fuel in France, such as the MELOX extension. The Parliament is not directly consulted on a question like this, which—under the established criteria—also escapes from the mechanism created in 1995 by the Commission Nationale du Débat Public (CNDP – national commission for public debate).

The public inquiry is a procedure for consultation—not for dialogue—of which all conditions are extremely restricted. First, it is limited in time to one, or by waiver, to two months and is limited to the municipalities around the project area. It does not comprise obligation of public meeting, and less still of public audition on the project. It is based on a single document, the case file, submitted to the inquiry by the requesting party, to the exclusion, in particular, of any preparatory documents, and reports from the inquiry commission which are produced, respectively, before and after the window of consultation. There is no procedure for counter-expertise of the case file, and there is no obligation on the requesting party to respond to observations from the public.

However, the problem of public assessment of the project—its risks and its advantages—relies on the existence of a capacity for expert examination of the file which, *in fine*, poses the problem of access to information. Such access is extremely limited in France, where the authorities and operators generally agree on a very wide interpretation of the notion of industrial and commercial confidentiality¹. Even

¹ By way of example, in 2002, WISE-Paris asked the safety authority and COGEMA about the manufacture of Japanese fuels at MELOX, to obtain, in particular, information on dates and tonnages. The safety authority

access to public information is difficult—the dossier submitted to the public inquiry by COGEMA can only be consulted for free *in situ*, otherwise it has to be paid for. It costs 300 euros to an association (or an individual) wanting to study a copy of the dossier on the MELOX extension.

Comparison with similar experiences in other countries confirms the extremely limited nature of the French procedure. Even though situations differ², the procedure authorizing extension of the MOX production capacity of the MELOX plant is shorter, is based on a smaller number of documents, and more limited modes of public consultation and of public meetings, etc. than the British procedures authorizing the BNFL Sellafield MOX Plant (SMP) or, even more so, those for the authorization of the Savannah River Site (SRS) in the United States.

Without even considering the contents of documents, the consultation procedure used in the framework of the SMP public inquiry demonstrates a real effort towards transparency and democracy when compared to the public inquiry procedure applied to MELOX. Instead of a single document, which can only be consulted in certain public premises or has to be bought, three dossiers were published, as well as other documents such as the opinions of experts, most of which could be viewed on the British Government's website³. National, and not local, consultation lasted eight months and included five successive stages, instead of a public inquiry limited to two months.

The American example is even more striking. First because American practice has little in common with French, or even British, procedures but above all because the authorization procedure in progress (for the fabrication of MOX using plutonium from military arsenals) is the project of a consortium of which COGEMA is a part (DCS, for Duke - Cogema - Stone & Websters). The procedure, started in 1998, demonstrates the ability of COGEMA to comply with consultation rules that are far more stringent in terms of participation and content, than those in France. The project is the subject of dedicated pages on the Nuclear Regulatory Commission's (NRC)⁴ website, where more than a hundred documents can be viewed. The process includes expert public hearings, including testimony from recognized associations, and two to three public meetings per year.

• Assessment of the dossier submitted to the public inquiry

The public inquiry dossier comprises two essential documents: the environmental impact statement and the risk study. WISE-Paris chose to analyze the contents of the dossier—and to compare them with external data—from three angles: **the technical aspect** including information on the process and associated risks; the **impact aspect** or all of the assessments of the installation's impacts on the environment and health, both during normal operation and in case of accident; and finally the **socio-economic aspect**, i.e. the assessment of economic and social spin-off from the project, its justification and presentation of possible alternatives.

In general, **the information brought together in the public inquiry dossier to present the installation, its processes and the flows of materials involved is insufficiently quantified, lacking in detail and incomplete.**

Risk assessment, which is at the heart of the public inquiry process, relies on a good understanding of the processes used in the plant and of the associated material flows. In this area, the information in the dossier is clearly inadequate. It is generally necessary to refer to other public documents to have access to essential data. In some cases, these data are not available from any public source. This is the case, for

referred us to the operator which had already refused to provide us with the information, invoking commercial confidentiality.

² It can, however, be noted that the procedure applicable to the extension of MELOX is, according to the terms of Decree No. 63-1228 regulating basic nuclear installations, identical in form to a procedure for creation of an installation. Furthermore, the conditions for public inquiry prior to the decree for creation of MELOX in 1990, and public inquiries concerning basic nuclear installations in general, do not differ from the conditions of the procedure for MELOX extension.

³ See, in particular: <http://www.defra.gov.uk/environment/consult/mox/sellafield/index.htm>

⁴ See the NRC's "virtual reading room": <http://www.nrc.gov/reading-rm.html> or the pages on the SRS case: <http://www.nrc.gov/materials/fuel-cycle-fac/mox/licensing.html>

example, for material flows within the plant—what quantities of what materials are stored in which part of the plant, and at which times.

The risk analysis presented appears, globally, incomplete and 'minimalist'. The dossier ignores the risk of proliferation and, for risks of external attack and accident, presents an approach that is more probabilistic than determinist, contrary to the approach developed today by the nuclear safety authority.

The problem of proliferation is not addressed in the public inquiry dossier which contains no presentation of accounting for nuclear materials in the installation, and no assessment of risk linked to transport of materials associated with its operation. The MELOX plant, however, uses around 7 tonnes of plutonium per year. This plutonium, of so-called "reactor grade" is perfectly usable for the making of bombs, as attested by the position of the International Atomic Energy Agency (IAEA)⁵, which considers that 8.5 kg of plutonium constitutes the "significant quantity" from which the possibility of making of a bomb cannot be technically excluded.

The risk analysis must be based on assessment of two essential parameters: the vulnerability and sensitivity of the installation to various accident scenarios or external attack, or how easily those scenarios could happen and with what potential consequences. Despite the fact that the characteristics of the processes at the MELOX plant—especially the use of nuclear materials in powder form—makes the installation particularly sensitive to certain risks, in particular loss of containment, the dossier proposes no ranking and treats all risks on the same level.

Application of a probabilistic logic, moreover, leads to exclusion of certain risks of external attack which today appear essential. Thus, in spite of the events of 11 September 2001, the dossier does not consider the crash of an airliner onto the installation, limiting itself to study of a small private plane.

The impact assessments in the public inquiry dossier do not provide an adequate basis to judge all of the real or potential impacts of the installation. While the radiological impact during normal operation is studied in detail—without nevertheless discussing its reduction—impact of other emissions during operation, and the impacts of emissions in case of accident are ignored or minimized.

The radiological impact of MELOX emissions is assessed, in the dossier, on the basis of emissions equal to 100 per cent of authorizations. The demonstration, which aims to guarantee that exposure of the public resulting from emissions in normal operation is very much lower than the threshold accepted by regulations, does not make it possible to measure probable developments in actual emissions. This is why the operator is required to develop approaches to minimize impact: ALARA (as low as reasonably achievable) and to use the best available technologies (BAT). The dossier does not make it possible to assess COGEMA's implementation of these optimizing approaches.

An important part of the impact of MELOX during normal operation arises from operation of the incinerator and, more globally, the production of waste arising from operation. The fact that the incinerator is included in a basic nuclear installation, and thus escapes the regulations usually applying to incinerators, poses a problem—as a result, the most toxic chemicals that could be emitted by the incinerator (dioxins, furans, etc.) are not even considered in the public inquiry document.

Regarding the impacts in case of accident, the probabilistic approach developed in the public inquiry dossier generally leads to reductive assessments and a minimalist estimate of the impacts, often brought down to zero. Such an approach cannot be adequate for a global assessment of the hazards, in particular the possibility of major acts of terrorism which cannot be covered by any probabilistic calculation, but which cannot be discounted today.

According to WISE-Paris' estimates, accident or terrorist attack scenarios such as the crash of an airliner onto the installation or explosion of a barge carrying LPG close by, could cause a large release of nuclear

⁵ We can quote Hans Blix, then Director of the International Atomic Energy Agency (IAEA) who, in a letter of 1 November 1990 to Paul Leventhal, President of the Nuclear Control Institute, Washington D.C., USA, wrote: "*The Agency considers plutonium from irradiated fuel with high burn-up rate and in general any isotopic composition of plutonium, with the exception of those containing more than 80 per cent of plutonium-238, as being usable for an explosive nuclear device.*"

The IAEA defines the "significant quantity (SQ)" as "*the approximate quantity of nuclear material for which, taking account of the necessary conversion processes, the possibility of producing an explosive nuclear device cannot be excluded*" (translation WISE-Paris).

materials. While the quantities of plutonium (or uranium) likely to be released are difficult to estimate, especially given the lack of information on flows within the plant, plutonium's high radiotoxicity⁶ and its dispersal when in powder form would necessitate evacuation of extensive areas. The contamination could cover an ellipse extending over several tens of kilometers, an area sufficiently large to reach the city of Arles, and lead to doses close to or above the annual limit of exposure of the public, i.e. 1 mSv. It could, eventually, cause tens, even hundreds, of fatal cancers.

Finally, the impact of MELOX plant operation must include an essential dimension: that of the associated transports—especially of plutonium. Here, WISE-Paris repeats the estimates published in its recent report on transports in the plutonium industry in France⁷, on serious accidents or criminal acts concerning a truck transporting plutonium oxide powder from La Hague to Marcoule, which could, in an inhabited area, lead to several dozens, or even hundreds, of fatal cancers in the long term.

The analysis of the socio-economic impact of the project and its justification are not developed seriously in the dossier submitted to the inquiry. This aspect is summed up in a few paragraphs of the dossier, which presents no economic data for the project, no summary of the expected advantages compared with disadvantages, nor discussion of alternatives. Despite the fact that the impact assessment should explain the reasons for which, "*among the parties envisaged, the project has been accepted*" and, above all, that the European Directive 96/29/Euratom requires the installation to be justified economically by a benefit which overrides environmental or other constraints, no element of the dossier allows the public to judge the actual socio-economic advantages of the extension.

Although the letter of application introducing the inquiry dossier clearly explains that extension is intended for the transfer of production from the ATPu, this problem is not addressed anywhere in the part covering socio-economic justification of the project.

The document submitted for inquiry focuses on the positive socio-economic effects relating to creation of jobs at Marcoule—40 jobs created directly and as many indirectly—but does not discuss the implications for employment at the national level. It does not examine the future of the 300 directly related jobs and as many indirectly related ones threatened by the closure of ATPu at Cadarache. And devotes even less space to global analysis of the negative consequences for employment in the manufacture of conventional uranium oxide (UOX) fuel that would result from development of MOX production.

Examination of the commercial situation of the ATPu indicates that the need evoked by COGEMA to transfer production to MELOX only concerns a few years of operation. The "*commercial prospects*" mentioned by COGEMA to justify extension of production in the longer term are, to say the least, hypothetical. They are based, in fact, solely on Japan, where the MOX use program was frozen, before it even got under way, after the scandal that broke in the Japanese nuclear industry in September 2002.

In France, different documents, and especially the report from Mrs Charpin, Dessus and Pellat to the Prime Minister in July 2000 on the prospects for the nuclear economy, show more and more clearly the absence of advantages of MOX fuel: the plutonium sector, with its present form of operation, represents an additional economic cost compared to direct storage—corresponding, for example, to more than 10 per cent of remaining operating expenditure for France's installed reactors. It presents no decisive advantage for waste management. Conversely, given the conditions of management of spent MOX fuels, the Commission française du développement durable (French commission on sustainable development) declared, in a report in February 2001, that the "*MOX option is not equitable with regard to future generations*".

⁶ Inhalation of a few µg (micrograms) of plutonium is sufficient to cause fatal cancer.

⁷ Marignac, Y. (Dir.), Coeytaux, X., Faid, Y., Hazemann, J., Schneider, M., *Les transports de l'industrie du plutonium en France – Une activité à haut risque*. Report for Greenpeace. WISE-Paris, Paris, February 2003, 101 pages.