

The myth of the "safe Swedish solution" to the problem of nuclear waste

The nuclear establishment in Sweden claim to have developed a safe way to store nuclear waste. They also claim that the method has been approved by Swedish environmentalist organisations. Both claims are false.

(515.5063) WISE Stockholm - Current thinking concerning storage of high-level radioactive waste from Swedish nuclear power plants has decades-long roots. In order to understand it one needs to know a little about the historical background. Back in the 1970s, when Sweden was still installing its (ultimately) twelve nuclear reactors, people were beginning to have second thoughts about the technology. The nuclear commitment became controversial. In order to deal with the rising tide of criticism in 1977 the Government introduced legislation that required the power companies to come up with a totally safe technique for storing high-level waste. Unless such a method could be devised, no nuclear reactor would be put on line.

The reactors had no time to gather dust. Only nine months later the industry, acting through a jointly owned subsidiary, Svensk Kärnbränslehantering AB (SKB) and affiliated experts, had come up with a "totally safe" solution: the KBS Method. The scheme was circulated for comment [the Swedish equivalent of a hearing] among both Swedish and foreign expertise. It was harshly criticized in virtually all respects. Among the more serious concerns was the failure to identify a rock formation that had the presumed characteristics. Much of the expert criticism fell on deaf ears. After a certain amount of hemming and hawing in September 1978 the bourgeois coalition Government found KBS1 to fulfil the conditions set out in the legislation of the previous year in all respects except for the identification of a site.

This finding was not reached easily. In fact, the governing coalition fell to pieces in the process.

Responsibility for approval of the siting was now transferred to the Swedish Nuclear Power Inspectorate, SKI, one of two regulatory agencies. Test drilling was undertaken at Sternö on the southeastern coast. SKI formed a group of eight geologists to examine the test results. Seven of the eight found the rock formation at Sternö inadequate. Ay, what to do? Never at a loss, the Board of SKI solved the impasse by approving the parts of the formation where no drilling had been done. At midsummer 1979, a Liberal-led minority Government approved the Sternösite. Sweden had therewith "solved" the problem of nuclear waste with a safe and environmentally acceptable technique. Work on additional reactors could resume.

In 1982, new legislation required reactor operators to undertake programmes of research and development on waste disposal and storage. The progress of the research (known as 'FUD') was to be reported at three-year intervals, starting in 1986. The responsible authorities (principally the Nuclear Power Inspectorate (SKI) and the Swedish Radiation Protection Institute (SSI) review the reports and make recommendations to the Government, which then decides whether or not to approve the conduct and aims of the

programme. FUD reports have been filed at three-year intervals ever since. Both nuclear waste and the FUD programmes are the responsibility of the nuclear power operators' subsidiary, SKB.

The Government's validation of the KBS method as a totally safe strategy in the late 1970s has hardly stimulated interest in alternatives to the method or even a critical view of the method - among either politicians, authorities or the industry itself. A "solution" had been established; all that remained was to put it in practice.

The licences to operate Sweden's nuclear reactors have been made conditional on positive reviews of the nuclear industry's R&D programme at three-year intervals. This may sound like a serious approach to the task. But one should not lose sight of the fact that half of Swedish electricity is produced by nuclear reactors, and no measures have been taken to change that. What are the chances that a Government would refuse to approve SKB's FUD programme? Minimal. What politician with normal survival instincts would willingly take on the responsibility of cutting the country's electricity supply in half with the stroke of a pen? In practice, both Government and the regulatory authorities have no choice but to approve the progress reports from the FUD programme, no matter what. The Government and authorities have painted themselves into a corner where they have to defend the strategy and performance of reactor operators and their waste management subsidiary; meanwhile, they continue to play a charade of regulating the industry.

Rock of Ages

In short, the proposed KBS method is the following: Spent fuel is loaded into steel canisters enclosed in copper casings. The canisters are then to be deposited into holes drilled in solid bedrock in a system of tunnels at a depth of 500 meter (1600 ft). The canisters will be insulated from the surrounding rock by a layer of bentonite clay so as to reduce the risk of leakage of radioactive substances, should one or more canisters fail. Once all the holes are filled, the tunnel will be sealed and left to its fate. The strategy was conceived (and approved) under the assumption that rock at a depth of 500 m would be virtually free of fractures - an assumption subsequently proved to be quite wrong.

Ever since the KBS plan was introduced in the 1970s, it has been touted by the industry as "the safe Swedish solution", clearly superior to any and all alternatives - a presumption elevated to dogma over the years. In fact, SKB have evangelized with such fervor that their credibility as serious scientists and engineers has been fatally undermined.

The Non-believers' side of the story

Environmentalist organisations in Sweden are unanimously critical, with regard to both the realism and practicability of the method and the way the nuclear establishment - reactor operators and authorities alike - have so single-mindedly promoted it.

SKB uses about 20 million crowns (US\$2.45 million) of the sums set aside for the safe handling and storage of spent fuel each year for its bare-faced propaganda.

SKB's manipulations and contrivances have long since totally eroded the company's credibility in environmentalist circles. It is difficult to respect an opponent who lies and misrepresents at every turn. Consequently, for the past 20 years environmentalist groups have repeatedly demanded that responsibility for the R&D programme and public information about the nuclear waste issue be taken away from SKB. These demands have not been "heard".

Another key point of criticism is the tactics used by SKB to identify suitable sites for a hot nuclear waste repository. Having met stubborn opposition from the local populations near

the sites proposed initially, SKB has changed strategy and now claims that the nature of the bedrock is of secondary importance. Public willingness to accept such a site has (de facto if not officially) become the prime criterion. SKB has singled out the communities where opposition may be expected to be weak or non-existent - regions with high unemployment and areas adjoining existing nuclear installations, where a good share of the population are already economically dependent on the nuclear industry.

Since about 1994, the shift from geological to socio-economic criteria has the sanction of the Swedish Government. In 1996, the Government appointed a so-called National Coordinator, whose principal task it was to facilitate contacts between SKB and Swedish local government. The Coordinator himself has described his role as "lubricating the machine" and helping to recruit the necessary number (5-10) of willing communities.

Safe - or just convenient?

SKB's first preliminary site evaluation was undertaken in Storuman in the far north in 1994-95. Not everyone in the sparsely populated community welcomed the studies. Once completed, a local referendum was held. The question: Should SKB AB be allowed to continue to look for a nuclear waste disposal site in Storuman? The answer: 71% No to 28% Yes. With that, SKB packed up and left the area.

A few other local councils which had indicated a willingness to be evaluated by SKB changed their minds. This rather dismal start to the search for a site caused considerable worry among the regulatory agencies, SKI and SSI. In February 1996, they wrote to the Government requesting additional funding for objective, authoritative public information. They motivated their plea: "...[E]xperience to date in the evaluative process indicates a clear risk that lack of public confidence may make it impossible to localize a permanent waste repository if we continue to follow the current strategy... The implications of such a failure for the nation's economy would be enormous."

The letter pointed out that "authoritative public information is an indispensable means to give substance to the siting process," commenting that public anxiety is mainly due to "lack of knowledge about radioactivity and the risks associated with radiation, but also to a lack of confidence that the information offered by the nuclear power industry has been neutral and factual". SSI and SKI got the money. It was, by the way, given them by the same Minister of the Environment who in November of the following year told the Swedish Parliament that neither she nor the Government had, or would assume, any responsibility whatsoever for the process SKB had started. This gap between word and actions hardly inspires confidence in the future course of the siting process.

In 1997, five additional local governments besides Storuman had said "No, thanks" to initial proposals from SKB. In one of them, Malå, the decision was taken after a local referendum. But SKB has three sure cards in hand, should worse come to worst: the nuclear communities, Oskarshamn (3 power reactors), Östhammar (Forsmark 1 and 2) and Nyköping (the Studsvik waste research facility: formerly a state research facility, now commercial and housing a nuclear waste recycling plant). All three are located on the Baltic coast. None is likely to reject a proposition on political or economic grounds. SKB has also shown interest in three communities adjacent to Östhammar and Oskarshamn, respectively. The enticements are the usual: promises of jobs, new industries, refurbished infrastructure, and so forth.

In all these communities, environmentalists have joined forces to meet SKB's propaganda offensive. In terms of economic resources, however, they are clearly operating out of an underdog position.

Dialogue?

In June 1997, the National Coordinator summoned representatives of the candidate local governments, the regulatory authorities, the waste disposal company (SKB) and environmentalist organisations to a roundtable discussion. He announced his intention to form a "national consultative forum", in which important matters relating to the siting process might be aired.

The environmentalists took the opportunity to express their criticisms of both the KBS method and SKB's tactics. Furthermore, they pointed out areas of persistent uncertainty regarding spheres of authority and questions of procedure in the decision process. Until the grey areas had been clarified, they argued, the siting process should be suspended. This line of reasoning was hardly appreciated by the industry. The National Coordinator's response was to exclude environmentalist groups from future discussions.

Clearly, the climate for constructive debate has never been the best. In the fall of 1998, however, environmentalist organisations and concerned parties in the communities under evaluation were once again invited to a meeting with the National Coordinator and SKB in conjunction with SKB's triennial R&D report, FUD-program 98. The environmentalist movement convened to debate the pros and cons of taking part in such a meeting. Opinion was divided, with the result that some organisations accepted and others declined the invitation.

Yet another meeting of more or less the same participants -minus SKB at the request of the environmentalists - was held in February 1999. Once again, criticism of SKB and the KBS method was raised, but much of the discussion focussed on the decision process and the roles of the regulatory authorities, the National Coordinator, local governments and NGOs in it. The discussion also sought clarification of the procedures for initiating and carrying out environmental impact assessments (EIA) in the light of Sweden's new Environmental Protection Code, which - for the first time ever - makes provision for NGO and public input in the assessment process.

It would be an exaggeration to say that the meetings resulted in any greater clarity on these issues. But, equally important, neither have they softened the criticism we raise.

All the nationwide environmental organisations in Sweden, which have monitored the issue of nuclear waste, filed formal comments on SKB's FUD-program 98. To summarize briefly:

1. All the organisations are highly critical of SKB's siting activities;
2. All find unacceptable flaws in the proposed KBS scheme;
3. All perceive SKB to be totally preoccupied with the KBS method and urge that alternative techniques be explored;
4. All have lost all confidence in SKB's ability to achieve an optimal solution to the problem of Swedish nuclear waste;
5. All complain that key aspects of the decision process still haven't been specified;
6. All are unsure when and how public input may enter into the decision process.

In conclusion

We in the Swedish environmentalist movement have repeatedly pressed Swedish authorities and politicians for answers to the last two points in particular. No clarifications have been forthcoming. Why?

My personal explanation is this: The Swedish solution to the problem of nuclear waste is not convincing from a technical or scientific standpoint, and it is not likely ever to be so.

The nuclear industry, politicians and authorities have realized this and have shifted their focus from striving for scientific legitimacy to what can be achieved by means of political and legal manoeuvring and propaganda. Their prime goal is no longer to deal with dangerous high-level waste in a responsible fashion, but rather simply to find an expedient solution to an embarrassing political issue. Consequently, they send out smokescreens and are feeling their way forward, step by step. The key is to remain flexible and not get caught in any fixed procedures that might be exploited by their adversaries, i.e., and environmentalist critics. After all, the strategy worked back in 1979!

In the nearly fifteen years I have been working on the issue of nuclear waste in Sweden, taking part in meetings, conferences, seminars and so forth with representatives of the industry and regulatory agencies, I have more and more come to suspect that the authorities look upon these meetings with environmental organisations as a purely therapeutic exercise. Therapeutic in the sense that they give anxiety-ridden, naïve and disruptive elements (that's us!) an opportunity to vent, under appropriate constraints, their irrational feelings and frustrations. The authorities, for their part, sit back and listen and speak reassuringly to us in hopes that after the session we will go home and put our fevered minds to rest and let the experts get on with their important work.

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