

Déjà vu – all over again!

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The “nuclear renaissance” is heartening many experts who in the industry’s heyday, expected to see continuous, rapid development of a powerful new technology. The expectations were not met -- instead, nuclear energy stagnated, especially in the western world. Three problems were responsible: public concerns about reactor safety, business doubts about economics, and no clear demonstration of a waste disposal route. Today, the first two issues have been resolved satisfactorily for most stakeholders – but waste disposal could again become a stumbling block to global nuclear power expansion.

For most of the public, “the waste problem” is unsolved, and the final disposal of radioactive wastes remains controversial. Will we repeat the mistakes that hindered nuclear in the past and allow the urgent need for energy to outweigh the need for repository implementation, which will again be postponed and neglected. Some signs are already apparent. The US earlier argued that operation of the Yucca Mountain repository was a pre-requisite for new nuclear power plants (NPPs) but today licence applications are being submitted despite the project’s uncertain future. Other developed countries, such as the UK, China, Taiwan, Russia and Canada, are contemplating new nuclear build, but with no repository in sight. And the hunger for electricity in numerous less developed countries now considering nuclear is attracting nuclear vendors who offer reactors and fuel services - but no disposal route.

It is neither feasible nor necessary for repositories to be available before new NPPs are built – it will be decades before a high level waste (HLW) or spent fuel inventory will be big enough to need disposal because of the long cooling period and slow accumulation. The crucial task is to ensure that all countries using nuclear now, or wishing to do so in future, have a **credible waste disposal strategy** that will lead to safe disposal when necessary - and that this is accepted by a large part of the population. Failure to achieve this in the early days of nuclear power gave opponents a powerful argument to brake or halt nuclear development. There is a danger this could happen again in the near future.

The nuclear renaissance could impact positively or negatively on efforts to plan and implement waste disposal strategies. If proof of a viable disposal option is seen as a prerequisite for new build, resources devoted to waste management will increase. On the other hand, in the “rush to nuclear”, waste issues may be judged less urgent than increasing dependable energy supplies or reducing CO₂ emissions. However It will be a serious mistake, if a rapid increase in nuclear power is again pursued without proper regard for waste. This will open the industry to criticism and intensify disposal-based opposition by environmental groups. Society must acknowledge that safe waste disposal is feasible and affordable.

The biggest challenge facing geological disposal is siting. Some successes have been achieved in large national programmes, following belated recognition that local communities must be directly involved in the siting process and must be willing hosts. But for new or small nuclear programmes, the high cost of repositories has spurred interest in possible cost sharing through multinational disposal projects. International security concerns have also led to pressure to concentrate nuclear materials at fewer, well controlled locations. Possible scenarios include smaller countries sharing facilities or large nuclear programmes accepting wastes for disposal from smaller ones.

Detailed work on multinational concepts has been carried out within the SAPIERR project, which concentrated on the feasibility of establishing one or more regional repositories serving several European countries. This has led to the establishment of a multinational working group charged with developing a framework for a formal implementing body for a regional repository. This partnering concept is also applicable in other global regions with small or new nuclear programmes. An alternative may be “take back” of leased fuel by a large supplier as proposed by the US-led Global Nuclear Energy Partnership (GNEP) and Russia’s Global Nuclear Power Infrastructure (GNPI). Unfortunately, neither is committed to retaining the HLW that would result from reprocessing the returned spent fuel, which means the client country would still need a small but very expensive geological repository.

In the past, the nuclear industry’s neglect of waste disposal resulted in waste management being seen as the Achilles heel of nuclear power. Today, from a technical point of view, the urgent tasks for a rapid expansion of nuclear are again not waste specific; they are related to rebuilding engineering capacities and component supply chains, accelerating licensing processes, and addressing the skills shortage. However, for long-term safety and security, the nuclear industry cannot afford to postpone developing credible waste disposal strategies for all nuclear nations, both large and small.