

Media briefing - May 16, 2007

Safety Implications of Problems in Olkiluoto

A report prepared for Greenpeace by nuclear expert Dr. Helmut Hirsch

Background on Olkiluoto 3

When the Finnish company TVO ordered a European Pressurized Water Reactor from the French company Areva, Finland became the first industrialized country in more than a decade to start nuclear construction. The reactor was supposed to “set a new standard for nuclear safety”, help fulfill Kyoto targets and provide Finnish heavy industry with electricity that is competitive on the free market. Now it seems that none of these promises will be fulfilled: already in 2006 there were more than 700 reported quality and safety problems; the project is 18 months behind schedule, at least EUR700 million over budget and subsidized by French taxpayers; claimed emission reductions will not be realized and emission credits will be bought with taxpayers’ money.

Olkiluoto 3 is extremely important politically - the government’s plan to cut greenhouse gas emissions and to avoid increasing dependence on energy imports relies completely on the plant. This importance is apparent in how the project has proceeded: Finnish authorities have from the very beginning lacked muscle to demand safety and quality when it requires slowing down the extremely ambitious timetable of the project or causing extra costs.

Safety failures

Several failures have happened during the construction. Many of them can increase the risk of a severe accident.

- There have been quality problems with all key components of the primary coolant circuit: reactor pressure vessel, pressurizer, steam generators and most recently the coolant pipes. A failure of any of these components can initiate a severe accident.
- Steel liner of reactor containment was manufactured by an incompetent Polish machine yard. Safety standards were violated during construction. The bottom of the liner is wavy and it was damaged during storage. The substandard quality of the liner can lead to higher radioactive releases in case of an accident.
- Concrete base slab of the reactor is more porous than was allowed, making the structure more vulnerable to chemically reactive substances. This can lead to long term deterioration of the reactor containment building. The concrete has a high water content, which could, under certain accident conditions, lead to rapid formation of cracks.

In response to failures to realize the required level of safety, Finnish authorities have in many cases loosened safety requirements. This has happened with the steel liner and the base slab.

The EPR design relies heavily on preventing a break of the primary circuit, since the safety systems of the EPR reactor model are not fully designed to cope with a complete break of the primary coolant piping, which is a violation of Finland’s nuclear safety standards and in direct contrast with claims made by Areva. This aggravates the potential consequences of failures during construction.

A warning example

Areva is trying to wave away the scandals around Olkiluoto 3 as “first-of-a-kind” problems that would not reoccur in subsequent EPR projects. However, there are good reasons to believe otherwise:

- Olkiluoto 3 is constructed under a tight schedule, with considerable cost pressure. The same is likely to hold for future nuclear power plant projects. The unrealistic price and timetable of Olkiluoto 3 have been a strong incentive for Areva to dump prices and to refuse to perform time-consuming corrections when problems arise. Areva’s attempts to reduce costs led the company to select cheap, often incompetent subcontractors, overlook safety related problems and not to provide nuclear safety training to workers.
- Any nuclear power plant constructed in the near future will be first-of-a-kind or among a few-of-a-kind, since there are several reactor models but only a few orders.
- Control of the project by the licensing authority was rendered particularly difficult because the detailed design of the plant was not finished at the time of the first license. Similar problems can be expected if “fast track” licensing of nuclear plant designs is legalized in other countries.
- Any Areva statement regarding the valuable experience gained from Olkiluoto should be contrasted with this claim from the company in 2005: “The EPR is the direct descendant of the well proven N4 and KONVOI reactors, guaranteeing a fully mastered technology. As a result, risks linked to design, licensing, construction and operation of the EPR are minimized, providing a unique certainty to EPR customers.”

Problems solved in Olkiluoto?

Finnish authorities and the involved companies all claim that the safety culture has improved markedly and all the outstanding problems have been properly addressed. According to the report, there are several reasons to be skeptical:

- Areva is under greater time pressure than ever before, now that the schedule has already slipped. New delays and disgraces would not only lead to trouble with TVO, but also further reduce their chances to sell more reactors. The incentive to cut corners is strong, and will become stronger with each delay.
- Safety standards have been loosened very recently to avoid costly remanufacturing of problematic parts.
- Most of the subcontracts were awarded long before claimed improvements in safety practices. Many of these subcontractors probably were not even informed of the quality requirements when they made their bid and were provided no safety training when they started their work.

The author

Dr. Helmut Hirsch has about 30 years of experience as nuclear expert. He has been working for the Austrian Federal Government as well as for German state governments and municipal administrations. He is a member of the Austrian Environment Ministry's Nuclear Advisory Board since 1990. Recent work includes technical support for the Austrian monitoring process of the Czech Temelín nuclear power plant; member of an OECD/NEA expert group.

More information

Lauri Myllyvirta, Greenpeace Nordic Energy Campaigner: +358 50 3625 981