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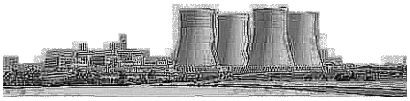

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Problems with the Belene NPP

1. General problems with nuclear power

All nuclear power plants (NPPs) know a very **small chance on a very large accident**[1]. Such accidents can be made less likely but never fully excluded. The extent of large accidents can be devastating, as the Chernobyl catastrophe from 1986 shows. Also the proposed design for the Belene NPP could have an accident with the magnitude of Chernobyl. In that case, cities like Bucharest, Alexandria, Turnu Magurele, Zimnicea and others in Romania, and towns like Svishtov, Pleven, Veliko Tarnovo, Russe and Nikopol in Bulgaria could be amongst the affected areas – all are within the 100 km zone around the reactor.

Each nuclear power plant is a possible **terrorist target**. Terrorist attacks could lead to smaller radioactive releases that would disrupt local life in the towns of Belene, Svishtov, Nikopol, Zimnicea and Turnu Magurele. They can also lead to large accidents, including melt-down, which could have a magnitude comparable with the Chernobyl disaster.

The issue of high **radioactive waste** from NPPs is not solved. No country has a way to safely store this material, that has to be kept out of the environment for 100 000 years or more.

Nuclear power – including the Belene NPP with at present a budget of over € 5 Billion – is a very **high cost** solution for meeting energy demand. It is impossible to build a nuclear power station without state subsidies, state guarantees, special market agreements or hidden subsidies like the state partly taking over liability, waste and decommissioning costs. For Belene it is proposed that several countries (states!) guarantee the loans for Belene, that the Bulgarian state carries part of the decommissioning and waste disposal costs and other mechanisms are still under discussion. Bulgarian State guarantees for Belene would be against EU regulations, as are direct and indirect subsidies. Even with such mechanisms it would be impossible to build a completely new NPP in Belene – only the returns of the sale of the already existing materials of the pre-1992 project maybe makes the Belene project possible.

2. Problems with the site

According to an original study by the Bulgarian Academy of Science from 1990[2], one of the most compelling reasons to skip the project is that it is **situated in a seismic active area**. Although the facts have not changed, the current Environmental Impact Assessment (EIA) report[3] denies this by basing its conclusion only on the 30 km zone around Belene and by completely ignoring the hard fact that an 1977 earthquake killed 120 people on no more than 14 km from the proposed site.

Belene is to be sited in a **rural area** where currently organic agriculture is developed. This form of

1 For more information: Mycle Schneider (ed.), *Residual Risk; An Account of Events in Nuclear Power Plants Since the Chernobyl Accident in 1986*, Brussels (2007) Greens / European Free Alliance: http://www.greens-efa.org/cms/pressreleases/dok/182/182275.nuclear_energy@en.htm

2 Plamen Tsvetanov (ed), *АЕЦ "БЕЛЕНЕ" - Изследвания и становище на Българската Академия на Науките (NPP "BELENE" – Analysis and conclusions from the Bulgarian Academy of Science)*, Sofia, (1990) Bulgarian Academy of Science, 421 pp.

3 Assoc. Prof. Eng. Ivan Ivanov, PhD, e.a., *Environment Impact Assessment Report; Non-technical Summary; Investment Proposal for Construction of BELENE NUCLEAR POWER PLANT*, Sofia (2004), Natsionalna Elektricheska Kompania EAD

sustainable agriculture will be directly threatened if a nuclear power plant will be situated so near. The Belene site is on the edge of a nature reserve, in the centre of a NATURE 2000 area.

Although it is acknowledged that Belene will create a few hundred lowly educated local **jobs**, the over-large majority of employees will come from outside the region – highly schooled employees from the closed NPPs in Kozloduy and from the Sofia region – even from outside the country. On the other hand, the region will loose some of its attractiveness for, amongst others, the Economic University and related investments and businesses in Svishtov. An in-depth analysis of the employment perspectives by this University showed that there may be a net-loss of employment for the region. This is comparable with the situation in Kozloduy, where the NPP offered work for people from outside the region, but the original population remains largely in poverty.

3. Problems with the technique

On 31 October 2006, the design for the Belene NPP was chosen. This design is of Russian origin. It is an AES-92 power plant with two VVER 1000/466B reactors. The Russians claim that this is a so called Third Generation nuclear power station. The reactor design is based on that of the VVER 1000/320 design, which also operates with 2 blocks in Kozloduy, and is for instance not admissible in Germany, where building a similar reactor in Stendal was stopped after re-unification. In comparison with the VVER 1000/320, constructor Atomstroyexport claims it contains advanced improvements to reduce the risk on a large accident like a heavier steel-aligned containment and a so-called core-catcher to reduce the risk of a melt-down. This new reactor type has so far not been licensed in Europe. Only one AES-92 power station, but with different reactors, is currently under construction in India and there is no practical experience with it yet.
There is in Europe one other Third Generation reactor under construction, the French designed EPR in Olkiluoto in Finland. A study made for Greenpeace has shown that also these advanced reactors are not safe for, for instance, an attack with a passenger airliner[1].

4. Problems with builders

On 30 October 2006, Bulgarian utility NEK chose the Russian / French / German consortium Atomstroyexport / Areva NP as builder of Belene. Like all other nuclear power station builders, the Atomstroyexport consortium members have a history of time schedule overruns and cost overruns. The EPR power station in Finland, which is built by Areva NP, was one-and-a-half years after construction started already 18 months behind on schedule. Atomstroyexport's projects in China and India are also months to years behind schedule. Same for budgets: the EPR in Olkiluoto, Finland was supposed to cost € 3,2 Billion – building costs are now estimated on around € 4 Billion. Atomstroyexport's construction contract for the Belene NPP is said to be € 3,997 Billion.

5. Problems with radioactive waste

As already pointed out above, there exists no final solution for the highly radioactive waste from nuclear power stations. Also not in Bulgaria. It is not expected that Bulgaria will have a final storage for its high radioactive waste before 2035, and even that date is under severe doubt. When localities were mentioned as possible sites, this provoked heavy opposition from local inhabitants.

Belene will also need a local intermediate waste storage. Such an intermediate waste storage is highly vulnerable for sabotage or terrorist attack. Planning procedures for this storage have not even been started yet, although it will be inevitable if the Belene NPP is built – surrounding inhabitants will be confronted with a *fait accomplis*.

1 Large and Associates, Assessment of the operational risks and hazards of the EPR when subject to aircraft crash, Amsterdam (2006) Greenpeace International; http://www.greenpeace.org/international/press/reports/assessment-of-the-operational

6. Problems in procedures

The Bulgarian Government twice took a decision to build Belene, although the Environmental Impact Assessment (EIA) for the project has not been concluded. A complaint from citizens and national and international NGOs against the approval of the EIA report at the High Administrative Court in Sofia was after two years dismissed without any argumentation (even though the law prescribes argumentation from the court). The complaints argued that the EIA is not sufficient, of low quality, that heavy accidents, terrorist threat and nuclear waste were excluded, that public concerns were not properly taken into account, that the procedure was not carried out in surrounding countries as prescribed under the Espoo Convention, and that the EIA hearings were strongly manipulated. During the court procedures, even the author team of the EIA report conceded that the report was insufficient and advised a new procedure to be carried out as soon as a design for the reactors has been chosen. This has so far not happened.

A Macedonian NGO appealed the EIA procedure on the basis of the Espoo Convention on EIAs in transboundary contexts, because Bulgaria had failed to inform the Macedonian government on its intention to build Belene. This court case is still continuing.

The Social Economic Analysis was not made public, and no public comments were possible.
The tender for a builder was clearly favouring Russian designs and for that reason most contenders, e.g. AECL from Canada, Westinghouse from the USA, Areva from France and Mitsubishi from Japan, withdrew from the procedure in an early stage.

7. Problems with financing[1]

In order to yield the projected electricity price of around 0,04 € / kWh, the Belene project can only be financed if it counts on a 60 year life time of the reactors. World-wide, there is no experience with such long life times. It also will need extremely advantageous conditions for financing like low interest rates, possible tax-cuts or tax-holidays, state- or export-agency credit guarantees, partial financing of front-end (fuel, infrastructure, etc.) and back-end (decommissioning, spent fuel processing) costs. On top of that, construction should remain within the budget (something that has never happened before in the nuclear sector) and during its life-time it should be able to boast a load factor of over 90%, which is an extremely rare feat, especially for first-of-a-kind reactors like the VVER 1000/466B.
The Belene NPP has a total budget of over € 5 Billion. It is under EU directives not acceptable to have this covered by state subsidies or other market-distorting financing mechanisms, but Belene will have to be financed completely under market conditions.

The Bulgarian government indicated interest from a large group of banks in financing this project. When these bank were informed by NGOs about a list of risks attached to the project that were not mentioned by the Bulgarian government, 11 out of 12 banks withdrew their interest or increased their conditions for financing, respectively made them more explicit. This led to a financing crisis of the project that already resulted in over half a year delay in the signing of the construction contract with Atomstroyexport.

In order to secure some financing, the Bulgarian government decided finally in January 2007 to tender a small and low-risk loan of € 250 Million. Also this procedure was delayed, but the tender was granted to the French bank BNP Paribas – the only bank not to react on the information it received from NGOs. BNP Paribas employs former Energy Minister Milko Kovachev, the architect of the Belene project restart, as consultant.

Bulgaria seeks to receive a € 300 Million **Euratom** loan, which would carry a low interest rate. It is not certain, however, whether this loan will be possible, as it also would constitute a market-distorting financing mechanism in breach with other EU regulations.

1 For more information on this subject: Stephen Thomas, Antony Frogatt, Peter Bradford and David Milborrow, *The Economics of Nuclear Power*, Amsterdam (2007) Greenpeace; http://www.greenpeace.org/international/press/reports/the-economics-of-nuclear-power