

NUCLEUS

Information Bulletin No. 16

15 December 2011

Intense Preparations for Engineering of the New NPP Started

On the 9th of December, Visaginas Nuclear Power Plant, UAB, signed a contract with Exelon Nuclear Partners, LLC (ENP), an international leader in the area of nuclear energy, which would act as an Owner's Engineer at the current stage of the project development. It means it is going to solve different engineering issues related to design and construction of the new Visaginas NPP jointly with the strategic investor and Lithuanian experts.

„A huge step has been made forward: a company well-known internationally by its competence and experience as an expert in operation of boiling water reactors has joined the team of developers of the Visaginas NPP project.“ – said Rimantas Vaitkus, the General Manager of Visaginas NPP, UAB. „Once again, it is a proof of maturity and professional development of the new nuclear plant project being implemented by Lithuania and its regional partners.“

According to Mr. Vaitkus, such additional professional supervision undertaken by highly qualified nuclear power engineers at the initial stage of the project development is an extra guarantee that our nuclear power plant under construction will ensure the optimal economic and engineering solution, be in compliance with all stringent safety requirements and be completed on due time.

The selection process of the Owner's Engineer for the Visaginas NPP project was carried out jointly with other regional partners for the new Visaginas Plant.

At present, experts engaged in the Visaginas NPP project are preparing the contracts in regulation of legal, commercial and technical areas of the Visaginas NPP project, and coordinating them with the regional partners and strategic investor. The



Contract was signed by Thomas P. Mundy, the Vice-President of Exelon Nuclear Partners (on the left) and Rimantas Vaitkus, the CEO of Visaginas Nuclear Power Plant, UAB

engineering design works of the new NPP will follow immediately after this stage.

Sharing Experience

„It has been a great pleasure to us being selected for consulting the Visaginas NPP and its regional partners about the issues of construction of the new NPP. Exelon's experience gained in development of different nuclear energy programs in different countries of the world will be useful to the Visaginas NPP, which aims at providing safe, reliable and competitive nuclear power to future generations of the Baltic region.“ – said Amir Shahkarami, the Senior Vice-President of Exelon Generation and CEO of ENP.

The Exelon Nuclear Partners, LLC, is a subsidiary company of Exelon Generation Company, LLC, with 100% shares held by the Exelon Cooperation (Exelon). The production capacities of electric power companies operated by the Ex-

elon are among the highest in the USA. The company provides electricity to 5.4 million consumers in the Northeastern States. The power plants by Exelon generate 20% of the total nuclear power in the USA, and its cost price is the lowest in comparison to the competitors'.

At present, Exelon operates 17 nuclear reactors in 10 NPPs of the United States. It is the highest number in the USA. Twelve of them are of the boiling water type (or BWR). The advanced new generation reactor of the same type (ABWR) will be constructed in Visaginas NPP. The remaining five reactors operated by Exelon are the Pressurized Water Reactors (PWR).

The annual revenues by Exelon amount to over 18 billion US dollars. The main headquarters of the corporation is in Chicago. Exelon is listed in the New York Stock Exchange under the quote EXC.

The Project of Visaginas NPP Being Implemented according to the Plan
Even after the company PGE of Poland has suspended its participation in the project, Lithuania has not changed its strategic goal to complete the construction of Visaginas NPP before 2020, working in cooperation with its regional partners Latvia and Estonia, and the strategic investor.

„Poland's decision to suspend its participation has not diminished the significance of the project, and we are still willing to take part in it. Lithuania still remains our priority. The Baltic States are financially capable to build this power plant even without Poland.“ – said Masahito Yoshimura, the Marketing and Planning General Manager of Hitachi-GE Nuclear Energy at the meeting with journalists of the Baltic States.

According to Valdis Dombrovskis, the Prime Minister of Latvia, the three Baltic States are sufficient for implementation of the Visaginas NPP project and successful continuation of the works.

„While implementing the Visaginas NPP project we will further strive for our goals, as we cooperate with our regional partners and a strategic investor.“ – said Arvydas Sekmokas, the Energy Minister of Lithuanian Republic.

Works

Within a very short time since July 2011, when Hitachi of Japan was selected a strategic investor of Visaginas NPP, a significant progress has been made in all areas of this strategic project: the official notification of the Visaginas NPP project was submitted to the European Commission in compliance with Article 41 of the EURATOM Treaty; Hitachi has carried out and successfully completed important technical works of the project development in relation to construction and operation of the Hitachi-GE ABWR reactor; and well-known internationally nuclear energy corporation Exelon has been selected the Owner's Engineer due to its highest experience in construction and operation of the boiling water reactors.

The reform for the project legal environment implemented by the Government and Seimas (Parliament) of the Republic of Lithuania has created favorable conditions and solid basis for further development of the project.

The next step – intense harmonization and coordination of contracts – is implemented according to the plan. It has been scheduled that Hitachi and the Ministry of Energy will reach an agreement on conditions of the Concession Treaty, which will be submitted to the Government and Seimas for approval.

These important guidelines of the Visaginas NPP project, achieved within a very short time, testifies the involved parties' follow-up obligation to implement this strategic project successfully.

What is the Owner's Engineer? Under the common international practice, in construction of huge infrastructure objects, e.g. power plants, a team of highly experienced engineers joins the construction experts. This is an extra guarantee reducing different risks to the minimum and ensuring the performance of the planned works smoothly and in compliance with the schedule, safety requirements and at the lowest possible input. A team of experts of the company selected to be the Owner's Engineer acts representing the interests of the Owner/ Owners of the NPP under construction. The Owner's Engineer's assistance may be sought for performance of separate works or in all stages of the NPP project development.

Table of Contents

ISSN 2029-5464

Visagino Atominė Elektrinė, UAB

14, Žvejų St., Vilnius, phone: 85 2782 99

info@vae.lt, www.vae.lt

2
page

The Future of Nuclear Energy in the Baltic Sea Region

Seven out of the nine states of the Baltic Sea region are engaged in nuclear power projects. It is of vital importance that all of them not only declare, but also ensure in practice the safety of these projects.

3
page

Strategic Investor Hitachi Is Waiting for Business Proposals

The strategic investor, Japanese corporation Hitachi introduced to the audience and presented business possibilities at the conference *New Opportunities for Local Businesses: Visaginas Nuclear Power Plant.*

4
page

New Nuclear Power Plant as an Alternative for Provision of Electric Power

Best Results in Nuclear Energy Countries

An ABWR Model in Exposition

Lithuania and Japan Exchanged Notes

On 29 November, Lithuania and Japan exchanged the notes defining the conditions for conveyance of nuclear technologies to Lithuania. This important legal step has ensured continuous negotiations with the strategic investor and preconditioned for timely signature of construction concession and other agreements of the new nuclear power plant.

By presenting its note, the Government of the Republic of Lithuania has undertaken to use the nuclear technologies to be imported to Visaginas NPP for peaceful purposes only and not to deliver them to any third parties without the exporting party's (Japan's in this case) consent. The diplomatic notes have been prepared in compliance with the requirements as foreseen in official documents by the International Atomic Energy Agency (IAEA).

*The Ministry of Foreign Affairs
of the Republic of Lithuania*

Prime Ministers of Latvia and Lithuania: Electric Power of Visaginas NPP will Be Competitive

Following their bilateral meeting in Visaginas, Prime Ministers of Latvia and Lithuania stated the electric power generated by Visaginas NPP would be competitive.

„We think this project, being of great strategic importance, also has an excellent economic competitive basis. According to the data we are in possession today, electricity generated in future Visaginas NPP will have good competitive advantage,“ – said Lithuanian Premier Andrius Kubilius after the meeting with his Latvian counterpart Valdis Dombrovskis. He also added that the numbers are still confidential.

Valdis Dombrovskis said he had no doubts about „the economic cost-effectiveness“ of the project.

Delfi.lt

President of Lithuania: Integration will Protect from Monopolistic Prices

Lithuanian President Dalia Grybauskaitė took part in the presidential meeting of the Baltic States held in Estonia. Discussing the goals and new challenges of the Baltic States, the Presidents underlined the presence of the only way to protect the people of Lithuania, Latvia and Estonia from monopolistic energy prices – that of the integration into the European Energy Networks. „Power and gas interconnections with Western networks, the liquefied gas terminal – these are the immediate steps that will ensure economic independence in the region and more secure life to our people,“ – Dalia Grybauskaitė emphasized.

*The Ministry of Foreign Affairs
of the Republic of Lithuania*

The Future of Nuclear Energy in the Baltic Sea Region

Article by Professor ScD. Eugenijus Ušpuras, the Director of the Lithuanian Energy Institute

Seven out of the nine states of the Baltic Sea region are engaged in nuclear power projects. It is of vital importance that all of them not only declare, but also ensure in practice the safety of these projects.

At present, 62 atomic reactors are operated in 32 nuclear power plants located in four countries of the Baltic Sea region: 4 in Finland, 10 in Sweden, 17 in Germany and 32 in Russia.

Visaginas NPP in Lithuania

In order to reduce its dependence on a single supplier, ensure safe and reliable supply of competitive electric power, diversify power generation sources and reduce the CO₂ emission quantities, Lithuania jointly with its regional partners Latvia, Estonia and Poland will construct the new Visaginas NPP before 2020.

More than 30 preparatory works for the Visaginas NPP project have been performed, including the international Environmental Impact Assessment. In compliance with the IAEA requirements, the construction sites have been assessed, hydrologic and thermal balance surveys taken in the Drūkšiai lake, logistic routes determined and the strategic investor and Owner's Engineer selected.

Poland Returns to the Nuclear Energy

According to the energy strategy adopted by Poland, construction of two NPPs (Visaginas NPP not included) is foreseen before 2020. Presently, coal-burning plants generate up to 90 % of the total electric power in this country. Considering its growing energy needs and extremely pollutant burning of fossil fuel, Poland has made a decision to return to the nuclear

power program, which was terminated 20 years ago.

Finland Cuts back its Imports

In the 1970-ies Finland launched two nuclear power plants: Lovysa and Olkiluoto. They produce about 21 TWh or 25 % of the country's total annual electric energy.

Finnish scientists have proven that nuclear energy is the cheapest in this Nordic country and its supply is much more stable in comparison to that of the hydroelectric power plants. Therefore in 2014–15, Finland will start the construction of 1650 MW reactor in Olkiluoto and two more in Lovysa, close to Helsinki. Besides, they still consider a proposal to build one more NPP at the Gulf of Bothnia.

Sweden Has Made a Change of Direction

In Sweden about 45 % of total energy is generated by the NPPs. The Hydroelectric plants produce approximately the same amount. Sweden exports a part of its electrical power. The first NPP in Sweden was constructed in 1960, and in 1980 a referendum was held concerning the nuclear energy future in Sweden. Parity of votes was shared among its supporters, opponents and abstainers, each getting one third of the votes. Then a decision was passed to close 12 NPPs before 2010 on the condition that a replacement source of this energy is found. But this plan has failed – the decommissioning of NPPs would cost Sweden about 200 billion SEK, huge electricity deficit would



„Nuclear energy has the future both, globally and in the Baltic Sea region, if all its generating states can ensure its safety,“ – says Professor ScD. Eugenijus Ušpuras

be made thus badly increasing its price. By the end of 2009 Sweden announced about its refusal of the previous policy of „full closing of NPP“.

Denmark Purchases from its Neighbors

In 1957–60, Denmark built its first three experimental nuclear reactors, the operation terms of which have already expired. Denmark has no plans for construction any NPP, but imports instead the electric power from Germany and Sweden. This amount satisfies up to 11 % of the total needs of this country. The Denmark's own electric power production capacities amount to 12.5 GWe, including 9.3 GWe generated by power plants fueled by fossil fuel and 3.1 GWe by wind turbines.

Continued on page 3

Stopping Emigration and Brain Drain

Two thirds of the residents of Ignalina and Zarasai regions fully approve the construction of the new nuclear power plant in Visaginas. 60 % of interviewed scientist and 58 % of students believe that the Hitachi corporation leadership in construction of the new Visaginas NPP will ensure the completion of this construction on due time and according to the fixed budget, the opinion polls show.

According to the data by Spinter Tyrimai polls, 62 % of the residents of Ignalina and Zarasai regions have expressed their approval to the construction of the new Visaginas NPP. The nuclear energy development has been mostly supported by the residents of Visaginas – by more than

88 %. The major part of the respondents thinks that with the completion of the new NPP, more jobs will be created. 51 % expect new roads, public purpose buildings; 49 % believe the standard of living is going to rise; and 42 % of the respondents think the new plant may even reduce emigration.

The use of atomic energy has been mostly approved by the respondents aged 26–35, with higher income and the residents of the regional centers.

Construction by Professionals

According to nuclear energy specialists, the construction of the new NPP is a complicated and complex project, therefore it requires experience in implementation of similar projects and highly qualified

experts. The strategic investor Hitachi is in possession of such experience and resources needed. The opinion poll's results have testified that the major part of Lithuanian academic community believes the implementation of the Visaginas NPP project will be beneficial for Lithuanian science. Even 68 % of responded students and 59 % of scientists think quite a number of skilled specialists from Lithuania will be employed in Visaginas NPP.

In the opinion of the academic society, the Visaginas NPP project may strengthen the ties between scientific and business institutions, cooperation between universities in Japan and Lithuania and could possibly slow down the „brain drain“ from Lithuania.

Alfa.lt, Balsas.lt

Strategic Investor Hitachi Is Waiting for Business Proposals

At the conference *New Opportunities for Local Businesses: Visaginas Nuclear Power Plant*, the strategic investor, Japanese corporation Hitachi introduced itself, shared the experience in development of nuclear reactors and construction of NPPs, explained the audience about the requirements it raises to its outsourced service providers, certificates required for performance of certain works and invited

Lithuanian business companies to submit their proposals by registering at Hitachi website www.hitachiasd.com.

The conference has shown that Lithuanian companies are interested in opportunities of getting involved in the Visaginas NPP project. Over 500 different business enterprises and associations, scientific and educational institutions took part at the conference. According to experts, it is

natural that the largest infrastructure project in the region of the recent decade will bring much benefit and experience to the companies involved in it.

If appropriately prepared, Lithuanian, Latvian and Estonian businesses may apply for the works with up to 30 % of the average project value, which makes about 4 billion Lit.

„In all countries, where it operates, Hitachi mostly tries to cooperate with local suppliers. While implementing the Visaginas NPP project, the company is also going to keep to its credo: cooperation with society and use of advanced and safe technologies”, – said Masaharu Hanyu, the Vice-President of Hitachi.

Hitachi representatives explained that the NPP is a complex project requiring from the businesses involved highest qualification and preparation, therefore the company already starts its dialogue with local businesses, which are invited to register by internet or apply to Hitachi Europe GmbH, Am Seestern 18, 40547 Dusseldorf, Germany, phone: +49-211-5283-0.

More information about the corporation, its activities, products and innovations is available on the Lithuanian website of Hitachi www.hitachi.lt.

VŠĮ „Versli Lietuva“

Gas Exchange to Be Established in Lithuania

On 23 November 2011, the National Control Commission for Prices and Energy issued a natural gas market operator's license to the electricity market operator Baltpool, providing for the possibility to establish a natural gas exchange. The exchange is planned to be launched in December, this year. The establishment of the exchange will be an alternative to trade based on bilateral contracts. It is an important step in creating a competitive and economically justified gas market in Lithuania. All natural gas consumers and other entities operating on the gas market will be able to sell excess and buy shortage volumes of gas at the natural gas exchange.

BaltPool

New Contract for Transshipment of Oil Products Signed

Oil refinery ORLEN Lietuva and the state-owned Klaipėdos Nafta have signed a new contract for transshipment of petroleum products. The new contract is based on optimal assessment of mutual needs and reached agreement satisfactory to both parties. It will be effective by the end of 2024. Rokas Masiulis, the General Director of Klaipėdos Nafta, noted that the current amendments of the 2002 agreement removed the excessive commitments and ensured the favorable transshipment conditions for both companies.

Alfa.lt



Conference *New Opportunities for Local Businesses: Visaginas Nuclear Power Plant* has drawn huge attention by local business representatives. More than 500 participants took part at the conference.

Continued from page 2

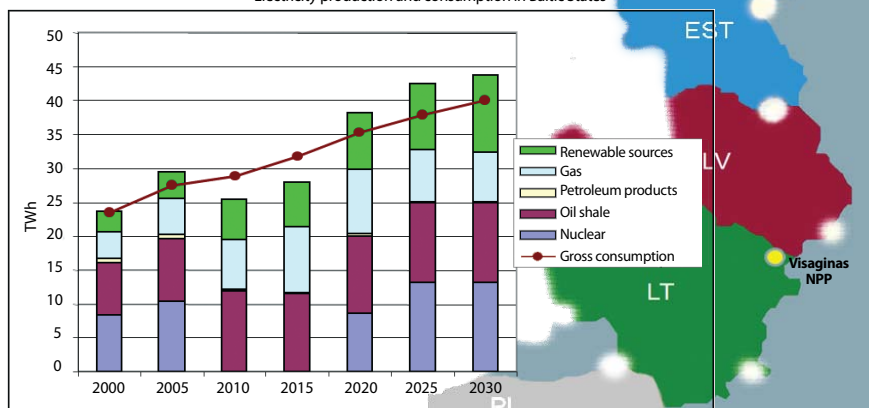
The Future of Nuclear Energy in the Baltic Sea Region

In 11 years, Germany without NPPS
Before 2022, Germany is going to fully forsake nuclear energy. At present, the nuclear power plants of this country produce about 22 % of total electricity, 64 % is generated by burning fossil fuel, and about 14 % – from the alternative energy sources (AES). Up to 2022 Germany is planning to expand the use of its AES, increase their stability and build new electricity transmission interconnections with the Czech Republic, Austria and France.

Russia: Full Steam Ahead
Russia fosters grandiose plans for nuclear energy development. By 2020 it plans to generate twice as much of electric power by its nuclear plants as they produce now. In 2020 its nuclear power capacities will increase up to 43.3 GWe. At present, its NPPs produce 16 % of total energy volume.

Safety in the First Place
After the earthquake of 9 magnitudes in Japan and disaster in Fukushima Nuclear Power Plant caused by the subsequent tsunami, the Council of Europe announced the NPPs of EU member states and their neighboring states would have to pass the earthquake resistance tests. The test results will be found out by the end of this year.

Baltic States (Estonia, Latvia, Lithuania)
Electricity production and consumption in Baltic States



Source: EU energy trends to 2030. Directorate-General for Energy, European Commission, 2010, Lithuanian Energy Institute

Growing Need for New Power Plants

As has been recently published by ENTSO-E, the European Network of Transmission System Operators for Electricity, because of the nuclear power plants decommissioned this spring, Germany in winter will become an electric power importing country. Serbia, Finland, Latvia and Lithuania will also import electricity from the neighboring states throughout the winter or at least some part of it.

Under complicated meteorological conditions, e.g. extremely cold winter, France, Belgium, Great Britain, Denmark and Portugal may also join the ranks of electricity importers.

„As the number of deficit electric power systems is increasing in Europe, Lithuania needs the basic generation of its own. Our country imports the highest volumes of electricity in Europe. Even 10–15 % power imports is considered an economic risk factor, whereas Lithuania has been continuously importing over 60 % of electricity consumed, for almost two years already,“ – says Virgilijus Poderys, the General Manager of electrical power transmission system operator Litgrid.

Continued on page 4

Continued from page 3

Forecasts are made that this winter Lithuania will consume by 1.2–1.8 % more electricity than usual, although any difficulties in providing energy to consumers are not likely. In nine months of this year, Litgrid transmitted 6.84 billion kWh electric power for the country's needs through its high voltage facilities, which makes by 1.8 % more than during the same period last year.

Verslo banga

Nuclear Energy Is Useful

The report *Climate Change and Nuclear Energy 2011* issued by the International Atomic Energy Agency (IAEA) states the implemented research has proven that use of nuclear energy may solve two major and interrelated problems of the contemporary world – that of the general climate change and rapid growth of energy needs. Besides, it can contribute to reduction of the green-house gas emissions at lowest costs.

NucNet

Great Britain Preparing for a NPP Construction

NuGen received a planning permission for preliminary site investigation and characterization works close to the Sellafield power plant in West Cumbria. It is planned to complete the works within 2013; decision to construct the plant is passed for 2015. The power plant may possibly be put into operation by about 2023.

WNA

New Nuclear Research Center

A new Nuclear Research Centre (NRC) – a joint venture between the University of Bristol and the University of Oxford – has officially been opened to help provide a skilled workforce for the UK's nuclear industry. The universities said that the new centre aims to provide leading edge and innovative research to support the design and safe operation of current and future generations of nuclear reactor technologies. The Center will focus on work for both fundamental research and for allowing emergent topics to be addressed, as well as developing new skills and providing high-quality graduates and post-doctoral researchers. Based on the research data supplied by the Energy and Climate Change Department, it has been estimated that the UK nuclear energy sector will create 30 thousand new jobs before 2025.

WNA

New Nuclear Power Plant as an Alternative to Provide for the Country's Energy Needs

Article by Saulius Kutas, the Nuclear Energy Expert

A new nuclear power plant is the only realistic alternative to solve essential energy sector problems in Lithuania by developing basic and stable electric power generation capacities and thus guaranteeing safe provision of electricity for the country and solving other important issues.

In compliance with the international nuclear safety principles, Lithuania was safely operating the Ignalina Nuclear Power Plant and ensuring secure electricity supply for two decades. I believe, it is important to guarantee that the follow-up use of nuclear energy, which is even entrenched by the Lithuanian legislation, becomes a reality.

Will Be Safe

It is understandable that Lithuanian residents are concerned about possible risks of the new NPP. It should be emphasized that most stringent requirements are set to nuclear plants – their safety principles

are fixed by respective international organizations, the country is developing the national nuclear safety supervision system. The shutdown and failure prevention system in the nuclear energy sector is one of the best and most effectively functioning on the global scale.

Summarizing the international statistics, it has to be said that while producing 20 billion kWh electric power (Lithuania generated such quantities in 2003), 3,500 people are killed per average in a coal-burning cycle, whereas only one man – in a nuclear fuel cycle. In comparison to the waste collected in fossil fuel burning plants, volumes of hazardous waste disposed by a NPP are very low, besides they are kept in reliable storages. We should not consider these facts the undeniable arguments in favor of nuclear energy, but they are persuasive enough to believe that on condition of implicit compliance with safety requirements, nuclear energy can be recognized and supported as an

important and economically efficient part within the energy sources' balance.

Not to Stay beyond the Touchline

At present especially, when the negotiations among all parties involved in the new nuclear power plant project are carried out, it is of vital importance to supply all correct information on nuclear energy and the course of the Visaginas NPP project implementation. This could be a good counterbalance to all unreasoned negotiations of the need for NPP, exaggerations of possible negative environmental impacts, etc. Any suggestions to postpone the construction of the new NPP waiting for new technologies, remain an importer of electric power, frightening of high costs without even comparing them to fossil fuel prices may cause a name of energy back-country and role of small purchaser within the European electricity market to Lithuania. Besides, we may miss any opportunity to influence electric energy prices.

Alfa.lt

Best Results in Nuclear Energy Countries

Sustainable energy sector development may be ensured by a variety of energy generation capacities – the analysis performed by the World Energy Council has shown that countries developing nuclear energy have achieved the best results.

In performance of energy and climate policy analyses and developing the energy sustainability indexes in different countries in 2011, three aspects of the energy policies were assessed, such as energy safety, ecology and cost-efficiency. According to the data of the report, the best

results were found in nuclear energy developing countries: Switzerland (40 % of nuclear power), Sweden (40 %), France (75%), Germany (30 %) and Canada (15 %). These states have the most consistent energy policies to ensure their energy safety, ecology and best energy price. All these countries are in possession of diversified energy portfolios with an important role assigned to nuclear energy.

Consent Matters

The report stated that in order to achieve sustainability in energy policies, it is not enough to pay attention to the green-

house gas emissions and rely on the market mechanisms. Representatives of different industries and policy makers must further work in cooperation to ensure stable legal regulation system, which has to support large-scale capital investments and rapid changes in the energy system.

It is noteworthy that the report was based mostly on the data of 2009–10, therefore its results still did not reflect the outcome of the Fukushima NPP disaster and recent political instability in Northern Africa and Middle East.

WNA

An ABWR Model in Exposition

On 22 November – 8 December 2011, the strategic investor Hitachi presented the technology selected for the new nuclear power plant in Visaginas – Advanced Boiling Water Reactor (ABWR) – for exposition in the Energy and Technology Museum. This is the only third-generation reactor operated at the moment with 1,350 MW power capacity and improved safety level. „A few hundreds of visitors used this unique opportunity to get acquainted with energy history and technological innovations in more detail within a few exposition weeks.“ – said Rasa Augutyte, the Director of the Energy and Technology Museum.



The 3rd generation ABWR developed and improved according to BWR operation experience of Europe, Japan and USA to strengthen the best features of such reactors.