

Address by Dr. Thomas Goppel, the Bavarian State Minister of Science, Research and the Arts, at the “Research Reactor Fuel Management” symposium in Munich on March 22, 2004

As State Minister for Science, Research and the Arts of the Free State of Bavaria, I am pleased to welcome you as participants at the 8th International Symposium on “Research Reactor Fuel Management” and as guests of the city of Munich.

Research Reactor Munich II, or FRM II, the new research reactor in Garching, falls within the scope of my responsibilities as State Minister for Science. The **FRM II is the sparkling diamond of Bavarian science and research policy.**

I am very pleased that the European Nuclear Society and the International Atomic Energy Agency have chosen the Bavarian capital of Munich as the site of this symposium. In doing so, these leading organizations in the field of nuclear energy have expressed their recognition of our FRM II, and that is truly an honour for Bavaria and Bavarian research policy.

The FRM II is a state-of-the-art high-flux neutron source. It opens a spectrum for research and experimentation that is unparalleled in the world. The facility replaces the old Research Reactor Munich, known as the Garching “Atomic Egg”, which has now been decommissioned after more than forty years of safe and successful operation. As the first research reactor in Germany, the Garching Atomic Egg heralded Germany’s entry into the technological age – in co-operation with and supported by the international community.

Early this month, on **March 2**, to be exact, we had good reason to celebrate. The FRM II “went critical” for the first time, generating its first neutrons. We had waited long for this moment, though for reasons beyond the control of the Bavarian government.

Actually, we had hoped to get the FRM II in operation fifteen years ago. But as everyone knows, things rarely turn out as expected in politics. Those of you who are familiar with the German energy and nuclear-reactor scene will surely understand this best of all.

The outstanding commitment of everyone involved in this project speaks for itself. We have overcome resistance from political and scientific-policy circles and brought the FRM II to successful completion. And our tenacity has paid off. Having commissioned the FRM II, we now have at our disposal a first-class interdisciplinary instrument from which science, research and industry will benefit. It will enable us to gain profound insights into the structures of materials, and neutron therapy will offer tumour patients new prospects for healing and recovery.

The FRM II was funded primarily with resources provided by the Free State of Bavaria. The fact that Bavaria undertook this **Herculean financial effort** is proof of the importance we attach to the development and expansion of the Bavarian research landscape. **Our goal is scientific excellence.** The FRM II greatly enhances Bavaria's position as a centre of scientific and commercial activity. It will play an outstanding role in ensuring a future rich in opportunity to the Bavarian, German and European scientific and industrial communities.

With its unique flux-to-thermal-power ratio and its experimental facilities, the FRM II sets new global standards. The spectrum of applications encompasses a wide range of fields, from physics and chemistry to biological sciences and material research, from environmental analysis to microelectronics and medicine.

This new neutron source represents a milestone in the development of Bavaria and Germany as bastions of scientific and commercial enterprise. In developing our concept, we have focused consistently on the international significance of the FRM II.

Over a period of many decades, Bavaria has consistently striven to establish excellent conditions for neutron research in Munich. We want to see world-class research done in Bavaria. We first began using neutrons for research purposes at the **Garching Atomic Egg** in 1957, and the groundwork for pioneering accomplishments in physics, chemistry, biology and medicine was laid here. The Research Reactor Munich was an indispensable aid to several generations of scientists from various disciplines. A number of discoveries flowed directly into economic benefits. On the basis of work performed at the Garching Atomic Egg, German neutron research has gained world-wide recognition and acclaim.

In keeping with the tradition of the Garching Atomic Egg, the new neutron source, the FRM II situated at the same location, is dedicated to the goal of developing a modern neutron source whose doors will always be open to both German scientists and guests from other countries.

The new research reactor will be used exclusively for civilian purposes, even though it is powered by **highly enriched uranium (HEU)**. The use of HEU is a prerequisite for generating neutrons in a small, compact core like that of the FRM II. However, we have reached an agreement with the Federal Government which calls for replacement of the HEU fuel with medium enriched uranium (MEU) by the year 2010. We have made this concession subject to the availability of a suitable substitute fuel element that will not reduce the performance of the neutron source. In close co-operation with the industry, a special project group composed of scientists from the Technical University of Munich is now working intensively on the development of a new fuel element. At present, however, no suitable, tested MEU fuel is available anywhere in the world.

We can and must learn to live with this **compromise**. Without it, the FRM could not have been commissioned, and we were unwilling to postpone the start of operations any longer. Further delay would have cost more money and, more importantly, eroded our technological lead.

The FRM II complies with **safety standards that are met nowhere else in the world**. In addition to system-inherent and special constructive safety features, the FRM II has also been built to withstand aircraft impact. It goes without saying that the nuclear reactor is effectively protected against every conceivable environmental influence, including earthquakes, flooding and shock waves. Moreover, the FRM II is designed in such a way as to ensure that radioactivity would remain enclosed within the building even in the event of a total core meltdown.

Now that the FRM II has been successfully commissioned, we want to begin using it for **highly innovative experiments**. And the FRM II provides the perfect setting for such experiments. It was developed as a highly efficient neutron source optimized primarily for radiation tube experiments but also offers excellent opportunities for sample irradiation. The concept provides for optimum neutron intensity while ensuring the highest achievable degree of safety and environmental compatibility. Every instrument designed for use at this facility is a genuine technological innovation.

Roughly 30 % of the experimental facilities will be used for industrial and/or commercial applications. The **business community is keenly interested** in harvesting the practical benefits of neutron research. In addition to funds appropriated for the FRM II, Bavaria has also made resources available for the purpose of establishing an industrial user centre which will enhance the attractiveness of the research reactor for use by the business community. This offers industrial users the opportunity to use office and laboratory space in order to prepare their experiments and evaluate results. They will have access to an experimentation hall for testing purposes. In this way, we are promoting rapid and efficient transition from the scientific laboratory to the marketable product, from research to real economic benefit.

In closing, I wish once again to extend a warm welcome to all participants at the 8th Research Reactor Symposium. More than 200 scientists from nearly 30 countries, including many from the U.S. and Russia, are here with us today. I wish you all a pleasant stay in Munich and stimulating dialogue with your colleagues both during and after the conference.

If your schedules permit, I trust that you will have a chance to acquaint yourselves with the city of Munich and take advantage of our diverse cultural programme. Munich is not only an outstanding centre of science in Germany but also a lighthouse of art and culture as well.

I sincerely hope that you feel at home in the Bavarian capital and take home fond memories of our city.