Taken from website:
http://flnph.jinr.ru/en/history/history-of-reactors
There is also am interesting video on YOUTUBE available on the page. The date of this entry is not available, but is certainly > 2004.

History of pulsed research reactors in Frank Laboratory of Nuclear Physics at Joint Institute for Nuclear Research, Dubna, Russia

The first IBR was created chiefly by physicists from Obninsk with the participation of specialists from FLNP JINR under the direction of Nobel Laureate I. M. Frank.

To simplify the design of a unique reactor constructed for the first time in the world, the IBR average power was chosen to be rather small 1 kW (but instantaneous power in pulse reached 5 MW). Later on the possibility to raise the reactor average power up to 6 kW with an increase in the consumption of cooling air was substantiated, and since 1964 the reactor worked at a power from 2 to 6 kW.

In general, rather long pulse of the reactor (50 µs) was more adequate to the tasks of condensed matter physics. To reduce pulse duration, at the suggestion of F. L. Shapiro since 1965 the first IBR started to be used in a neutron pulse multiplication mode of a neutron-producing target of the electron accelerator-microtron. With the start-up of the pulsed booster (that was the name given to the tandem of the accelerator and IBR) the neutron pulse length reduced to 3 µs.

The first IBR stopped its operation in August 1968. It is particularly remarkable that the last experiment on this reactor was a well-known experiment on the first observation of ultracold neutrons carried out in a rare pulse mode. On June 10, 1969 an advanced analogue of IBR {IBR-30} was put into operation. An increase in power was achieved by changing the design of plutonium fuel elements and by introducing two uranium inserts (modulators of reactivity) instead of one in the steel disk.

The operation in a booster mode (IBR-30) was used in the reactor and booster modes alternately up to 1986, when its operation in the reactor mode was stopped. Then the resonant linear accelerator LUE-40 as an injector with an energy of accelerated electrons of 44 MeV and a pulse current of 0.2 A was installed. An average power in the booster mode was 10 kW at a fast neutron pulse halfwidth of 4 µs. High luminosity of the spectrometer at IBR-30 made it possible to open up a number of entirely new areas in nuclear research and condensed matter physics.

The IBR-30 booster was taken out of service in 2001 with a view to replacing it in the future with a booster with a significantly shorter pulse. In 1992 the concept of a new source called IREN (Intense REsonance Neutron pulsed source) was formulated. At the 75-th Session of the JINR Scientific Council in May 1994 the IREN project was granted an official status of the project of a new basic facility in JINR. As a consequence of insufficient financing of the IREN project, by now only the manufacturing of accelerating sections and plutonium fuel elements has been completed and the assembling of the accelerator in building 43 has been started.

In 1963 preliminary design works were started to explore the possibility to create a much more powerful IBR, which in its neutron characteristics for investigations by slow neutron scattering methods would compare well with 50-100 MW stationary reactors (HFR in ILL, Grenoble, SM-2 in RIAR, Dmitrovgrad, PIK in PNPI RAS, Gatchina). In JINR a new reactor with a design power of 4 MW under the name IBR-2 was constructed by 1977 with the participation of NIKIET (A. N. Dollezhal Research and Development Institute of Power Engineering), SSDI (State Specialized Design Institute), VNIINM (A .A. Bochvar All-Russian Research Institute of Inorganic Materials) and other institutes and organizations of the USSR and JINR Member States. The physical start-up was in 1978 and the official operation began in April 1984. Later on it was decided to restrict the average power to 2 megawatts to ensure the maximum possible nuclear safety and reliability of the facility, and the pulse duration turned out to be 216 µs instead of design value of 90 µs. But even with these parameters IBR-2 was, and still remains, to be one of the most effective pulsed sources of slow neutrons for condensed matter investigations.

The requirement to obtain high neutron fluxes at short pulse duration also led to the necessity to create a compact zone with high specific heat release and short neutron lifetime. An active zone of plutonium oxide with sodium cooling was chosen. The sodium cooling system has been functioning successfully and uninterruptedly since its startup in 1981 to the present day.

The movable reflector is one of the most crucial and technically most original units of IBR-2. It has no analogy, not only in reactor engineering, but also in other areas of mechanical engineering. It is the movable reflector that determines the pulse duration of the IBR power – the key parameter governing the resolution of neutron spectrometers on reactor beams both in diffraction experiments and in inelastic neutron scattering studies. As a result of design and experimental test-bench studies the configuration of auxiliary movable reflector AMR (the so-called "trident") has been found. Three modulators of reactivity with AMR in the form of trident operated at IBR-2 from the reactor start-up to 2003 for 6-7 years each. Then a grating reflector of nickel alloy was created for low rate of rotation retaining the same pulse duration. It was successfully put into operation on the reactor in 2004, demonstrating 220 µs at a rate of rotation of MMR being only 600 rev/min. Operation at a low rate of rotation makes it possible to prolong the resource of safe operation of MR up to 20 years. The same reflector will work at the modernized reactor IBR-2M.

Any reactor has a limited lifetime because of the development of radiation fatigue of structural materials. In the middle 90s the program of modernization of the IBR-2 was initiated to replace the most part of its units, whose service life period is expected to expire in 2007. The modernization assumes, along with replacement, simultaneous improvement of the key elements, such as the reactor vessel, stationary reflector, executive units of emergency shielding, outer neutron moderators, in order to enhance the reactor reliability and durability. In addition, a new concept of composition and arrangement of neutron moderators around the modernized IBR-2M reactor will make it possible to create the best conditions for efficient use of the modernized and new spectrometers. On the new reactor it is planned to widen the scope of application of cold neutrons in the context of growing interest to investigations of nano- and mesoscopic structures in condensed matter physics and biology.

The IBR-2 research pulsed reactor in FLNP JINR is still the most effective source for investigations on extracted beams of slow neutrons in the world and within the next 20 years after modernization it will be among the first five world leaders in this area of nuclear science.

Thus, there is no doubt that the way of development of neutron sources in JINR was chosen correctly, its advantages became especially evident during the reforms in Russia with constant financial deficit. JINR would have been unable to keep in operation such a huge, expensive machine like SNS.

Throughout its 50-year history the JINR had and will have fine opportunities for neutron investigations owing to the elegant idea of a pulsed reactor conceived in Obninsk in 1955 and effectively used in the Frank Laboratory of Neutron Physics.