

JAIF HOLDS 1978 ANNUAL NUCLEAR POWER ENGINEERING WORKSHOP

Japan Atomic Industrial Forum held the 15th Annual Nuclear Power Engineering Workshop in Tokyo over August 31 and September 1.

The Nuclear Power Engineering Workshop was established in 1958, since when it has expanded with new participants from among JAIF affiliate members, including a wide range of organizations; power companies, manufacturers, universities, institutes, etc. The Workshop is a research group that meets to help train technical engineers and mechanics dealing with nuclear energy: it holds regular conferences, exchanges information among members, conducts research and collects data. It is actually twenty years since the Workshop started nuclear educational activities, during which time it has helped to train over 4,800 researchers, engineers and mechanics.

The Annual Conference holds two sessions, with 10 groups in Session I, (1) Economics, (2) Instrumentation and Control, (3) Nuclear Reactor Safety, (4) Industrial Complexes, (5) Nuclear Fuel Reprocessing and Radioactive Waste Management, (6) FBR, (7) Nuclear Fuel, (8) Power Plant Construction, (9) Health and Safety and (10) Radiation System Designing. Reports are presented on results of research done during the past year, on experiences in nuclear power plant operation and their reliability, radiation protection and decontamination, the economics of nuclear power in Japan, ideas on underground nuclear power plants, comparison of conceptual designs of various new type reactors and so on.

At Session II, the question of "Safety of All the Processes of the Nuclear Energy System" was taken up, in which Dr. H. Suzuki (Tokyo Institute of Technology) set out the aim of the theme: "In this age when nuclear power has to play an increasingly important role, in order to acquire public acceptance, it is most important and urgent to achieve comprehensive safety throughout all processes of the nuclear fuel cycle." He went on to say: "The safety of nuclear power plants must be ensured as experiences in their operation are accumulated, but it is a fact that little progress has been made in research on safety in radioactive waste management. Such unsolved problems should be taken up and made urgent tasks to be fulfilled from now on."

Dr. T. Takekoshi (Central Research Institute of Electric Power Industry) expressed his opinions on the overall risks of the nuclear power system. "There are no problems in general in the stages of uranium ore exploitation and refining; even for the problems of nuclear fuel reprocessing and radioactive waste disposal, appropriate measures are being accomplished gradually. But, he pointed out, "at present, there is still a considerable range of data needed for quantitative evaluation that must depend on presumed values." He put forward this proposition: "It is necessary to expedite the establishment of a quantitative evaluation method by which a comprehensive evaluation of the whole system can be made in the future."

Dr. H. Yishida (Japan Atomic Energy Research Institute) delivered a lecture entitled: "Formation and Decaying behavior of Radioactive Substances (Actinoids Nuclide) in the Nuclear Fuel Cycle of Reactors of Various Types Centering around LWR." He said: In order to incorporate nuclear reactors into the full-scale energy supply system, it is essential that the nuclear fuel cycle be fully provided, including nuclear fuel fabrication, reprocessing, transportation and radioactive waste management." Among other matters, he took up the question of how to consider measures for the management of radioactive wastes, and said: "We should not take such an attitude as will leave to posterity the matter of management of harmful radioactive wastes, including radioactive actinoid nuclides, and others which are fission products that require storage for the order of 100,000 years, but should immediately undertake the disposal for ourselves; it is necessary therefore for us to develop positive methods of their deactivation of harmful actinoid nuclides." In concrete terms, Dr. Yoshida enunciated the effectiveness of the recycling of actinoid nuclides in the thermal reactor and the fast reactor and the introduction of an actinoids burning reactor.

Dr. S. Emura (Power Reactor and Nuclear Fuel Development Corporation) spoke about the quantities of radioactive wastes which are expected to accumulate in Japan. He estimated: "The quantities of medium-and low-level radioactive wastes expected to be accumulated by the year 2000 will be 3,680,000 packages of 200 litres, and of high-level wastes, 14,000 canisters of 100 litres." For the treatment of high-level wastes, Dr. Emura indicated that for the time being, vitrification would be adopted principally, and added: "For their disposal, when a storage of 1 km² is constructed in underground granite layers 1,000m deep, it is possible to store about 40,000 canisters of 100 litres there, and in the case of Japan, their storage in such underground facilities will be available until about 2020."

Dr. T. Inoue (Central Research Institute of Electric Power Industry) delivered a lecture entitled: "Social Total Risk and the Nuclear Power "Natural accidental mortality rate is about 10⁻⁶ persons a year, and when immediately be taken, but in the case of the risk being about 10⁻⁶ persons a year, scarcely any concern is shown." Dr. Inoue then stated: The mortality risk due to a nuclear reactor described in the 'Rasmussen Report' is as low as about 10⁻¹¹ persons a year, and so is practically negligible." He explained the present situation as: "The difficulty is that information on various kinds of risks other than radiation, as, for example, that of chemical poisons, is extremely scarce, and it is only recently that quantitative analyses of risks began concerning an extremely limited number of deformity inducing substances and carcinogenic substances." He also touched on the problem of occupational radiation exposure, saying: "From the viewpoint of the seriousness of risks, priority should be given to measures for solution of the greater problem of occupational radiation exposure rather than those for small problems of the general public. In the evaluation of risks arising from radioactive substances emitted from a reactor in which an accident has occurred, sufficient consideration should be given to the evaluation of occupational radiation exposure suffered by workers in nuclear facilities so as to prevent hazards in the case of a

reactor accident, simultaneously with the evaluation of risks which the general public may suffer. It may be added that if adequate measures are taken against risks of occupational radiation exposure, the number of injuries and fatalities due to dangers other than radiation exposure (such as falls, collisions burns) are much greater than those caused by radiation exposure. he concluded.