

New Canadian fuel design developed in record time

A new Canadian nuclear-fuel design has been introduced and developed to the commercial production stage within two years – a record time. Some of the new fuel has been in service at the Pickering generating station near Toronto since the spring of 1972.

The new design was developed at the Chalk River nuclear laboratories of Atomic Energy of Canada Limited (AECL). The program resulted from the monitoring of the performance of fuel in the reactor at Douglas Point, Ontario, Canada's prototype nuclear-power reactor, on Lake Huron.

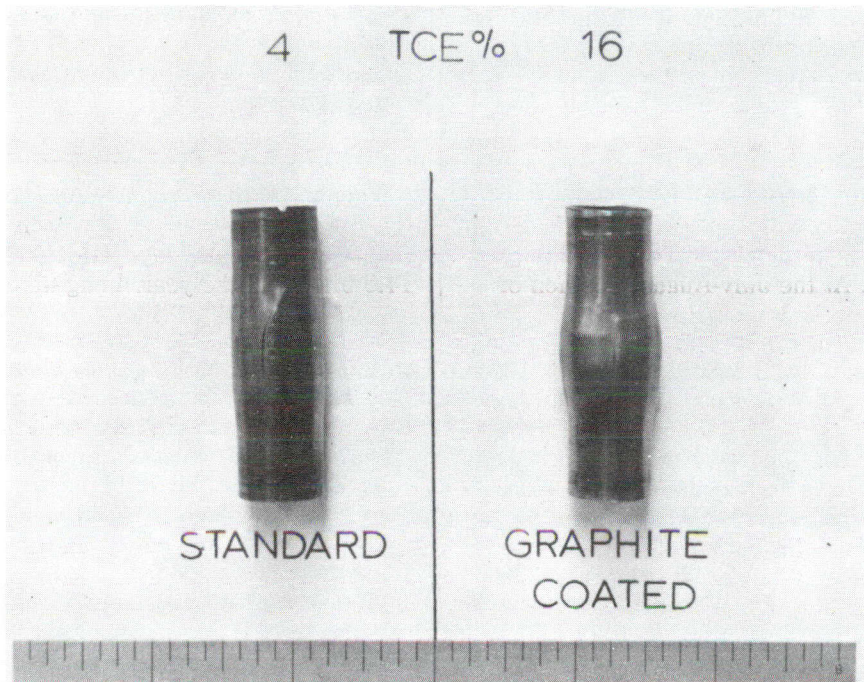
Douglas Point used a fuel common to most of the world's nuclear-power reactors, uranium oxide in zirconium-alloy containers. The rate of fuel failure was low – less than 1 per cent of all bundles loaded. However, a detectable increase in the rate indicated a potential problem that might cause trouble in the future.

Some scientific detective work by fuel specialists, who analyzed the operating history at Douglas Point,

led to tests at Chalk River, where it was demonstrated that the position of fuel bundles in the reactor had an effect – fuel would sometimes fail if its power output were increased after a prolonged period at low power.

A solution to the problem proved simple and inexpensive – introduction of a thin layer of graphite between the uranium oxide and its container. The remedy should be effective in other reactor types where fuel is exposed to a power increase during its lifetime in the reactor.

The normal lapse of time between the introduction and commercial production of new products in complex technologies was cut considerably by co-operation among the participants in the program: Ontario Hydro, the utility; Canadian General Electric Co. Ltd. and Westinghouse Canada Limited, the fuel manufacturers, and AECL, the developer. Within two years of the identification of the problem the improved fuel was in use at Pickering station.



Each of the reactor fuel-sheathing samples (above) was tested to destruction by a simulated fuel-expansion technique. The difference is that the sample on the right has a graphite interlayer between sheath and core.

The figures above the samples tell the story; the total circumferential elongation (TCE) or ductility of the graphite-coated specimen is four times greater.

AECL photo

Parole system needs to be simplified Senate Committee told

Changes are required in the basic structure of Canada's parole system in order to simplify it and increase its flexibility, according to the Canadian Criminology and Corrections Association, an affiliate of the Canadian Council on Social Development.

"Faced with an overlapping jurisdiction and a multiplicity of technical provisions and procedures, the individual caught up in parole, whether as an offender, an official responsible for its application, or a member of the public, often finds himself at a loss," the Association stated in a brief to the Standing Senate Committee on Legal and Constitutional Affairs.

The introduction of a more simplified parole system should be accompanied by an organized program of interpretation and education, said the Association, a national voluntary body of persons interested in promoting the better administration of criminal justice.

To be consistent with the interpretation of parole as an intrinsic part of the sentence of the court, the Association said "we consider that the power to change the sentence by discharge from parole before completion of the parole period or to revoke or suspend an order made under the Criminal Code prohibiting any person from operating a motor vehicle should be removed from the National Parole Board".

Other recommendations

"We are also of the opinion that the National Parole Board should be relieved of its present responsibilities under the Criminal Records Act. The board would then be free to concentrate on one function alone – parole."

The Association also recommended that the power to reduce the minimum period the inmate must serve before becoming eligible for parole be transferred to the courts from the National Parole Board.

Other recommendations in the brief include:

That the two responsibilities now carried by the chairman of the National Parole Board – chairing the board and supervising and directing the National Parole Service – be carried out separ-