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## SOUTH AFRICA

### Eskom's pebble bed reactor presented to government

ESKOM, SOUTH AFRICA'S state-owned utility, has made a presentation of its pebble bed modular high-temperature reactor (PBMR) project to the Department of Minerals and Energy. The company is expecting a green light soon from the cabinet, setting in motion a public consultation process and an environmental impact assessment. If all goes according to plan, construction of a demonstration module could commence next year.

A single PBMR module would be sized to produce about 110 MWe. The modular approach makes it possible to build smaller nuclear power plants to serve local needs and to expand them as demand grows.

Eskom, which operates the Koeberg station—two 900-MWe pressurized water reactors—is expected to retain 30 percent interest in the venture, with South Africa's Industrial Development Corporation holding 25 percent. A further 10 percent is being put aside for black empowerment partners (companies with black managers and black investors) as is required under government policy.

According to Eskom's Tom Ferreira, negotiations with a potential overseas partner for a substantial stake in the project has reached an advanced stage. Observers are pointing to Germany's Siemens, whose subsidiary HTR developed the original pebble bed technology, and the Chinese, who have their own HTR development program.

Assuming shareholder approval and government consent, preliminary construction activities could commence by mid-2001. Completion of construction and first criticality of the reactor should occur about three years later,

*If things go as planned, construction of a demonstration module of Eskom's pebble bed modular high-temperature reactor could begin in 2001.*

to be followed by one year of commissioning activities. The demonstration plant could therefore go into commercial operation by 2005. Eskom has conditionally agreed to buy 10 modules if the demonstration plant proves to meet expectations.

The PBMR is relatively inexpensive to build compared with other energy generators. Eskom estimates that in South Africa, the output cost will be about the same as the cost of electricity produced by a coal-fired plant situated at the pit-head. The cost per unit, claims Eskom, will be much cheaper than for coal-fired plants elsewhere in the world, or for one on the South African coastline. Decommissioning, long-term storage of radioactive waste, and insurance costs are included in these estimates.

Ferreira said that an independent assessment of the world market shows that up to 20 modules—which represents only 2 percent of the world market's annual capacity requirements—could be exported per year once the technology has been fully demonstrated.

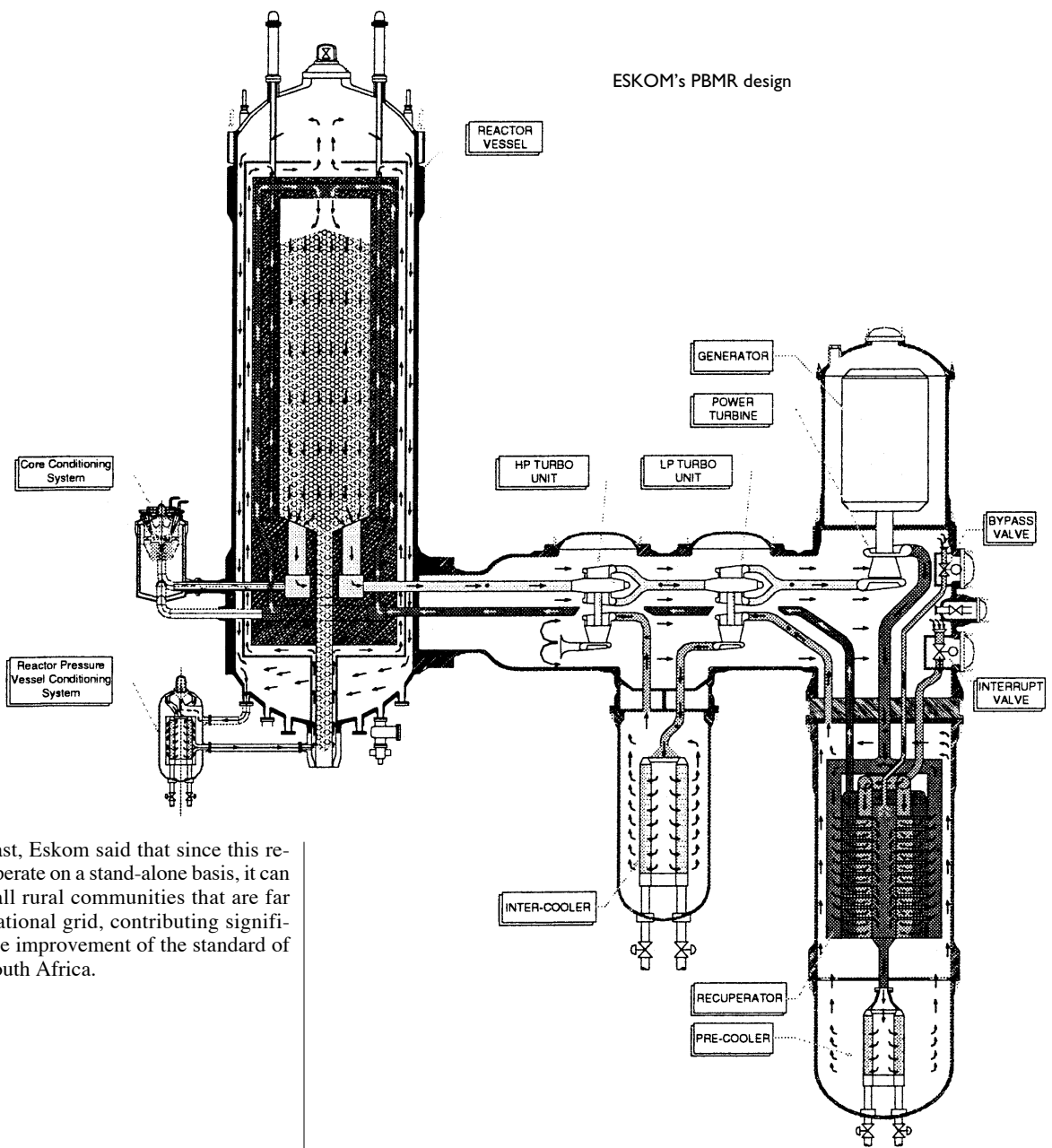
The PBMR project was launched in 1993 following a review of potential nuclear options. While that exercise left no possibility for building another large light-water reactor, due to cost and public acceptability issues, a small, inherently safe reactor system based on

the pebble bed HTR did fit its needs. Eskom undertook extensive reviews of the original technology developed in Germany, mainly by HTR, a joint venture between Siemens and ABB, and examined other relevant developments throughout the world. These provided the company with a high degree of confidence that the project was feasible and carried an acceptable level of technical and commercial risk. The Eskom team also considered the regulatory regime in South Africa.

A conceptual design for Eskom's PBMR was carried out during 1996 and 1997. Eskom made a policy decision to proceed with the project in March 1998.

As expected, Eskom's nuclear plans are being attacked by environmentalists, who have noted that the project is financially risky and technically difficult, pointing to the failure of the United States and Germany to commercialize the technology in the past. They also say that the reactors may be wholly unnecessary given the country's surplus generating capacity and access to other power sources, and suspect that nuclear energy companies regard South Africa as a potentially easy place to operate because of what some environmentalists called its looser licensing regime.

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In contrast, Eskom said that since this reactor can operate on a stand-alone basis, it can supply small rural communities that are far from the national grid, contributing significantly to the improvement of the standard of living in South Africa.