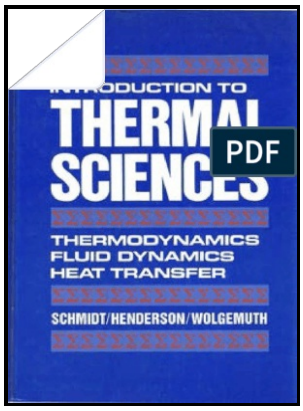
Out-of-pile thermionic space power systems using a gaseous heat-transfer fluid

Rand Corporation - Out



Description: -
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Thermionic converters.
Space vehicles -- Nuclear power plants.Out-of-pile thermionic space power systems using a gaseous heat-transfer fluid
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Tags: #Radioisotope #Power #Systems #for #Manned #Space #Stations

Optimization of a closed Brayton cycle for space power systems

Entombment is an acceptable decommissioning strategy; however we would have to change our concept of entombment. It includes a heater assembly having a top end and a bottom end and a plurality of concentric heater tubes having electrical circuitry connected to a power source, and radially spaced from each other.

Optimization of a closed Brayton cycle for space power systems

The fuel plate is designed so that the portion nearest the poison section of the control rod contains about one-half as much fissionable material as in the rest of the plate, thereby eliminating dangerous flux peaking in that portion.

Radioisotope Power Systems for Manned Space Stations

The reactor concepts must be mated to a power conversion technology that can offer safe and reliable operation.

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Potential supercriticality hazards and countermeasures are considered.

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In 1985, the high-temperature 1,350 K , lithium-cooled reactor with thermoelectric conversion was selected for full scale development. An array of rods is closely packed in an interfitting arrangement, with the bulges of the rods received in the recesses formed between the bulges of other rods, thereby closely packing the nuclear fuel.

Optimization of a closed Brayton cycle for space power systems

Holes are provided in the sleeve so that coolant from the plenum can enter the sleeve and cool the fuel. The decommissioning process is slowly making facilities associated with this industry disappear and not enough is being done to preserve the information for future generations. In operation a coolant gas passes through the porous structure and is heated.

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This paper describes an optimization study of the space power system based on a closed Brayton cycle CBC. A conservative worst-case hazards analysis was performed for radioactive and nonradioactive toxic SP-100 materials assumed to be dispersed during end-of-life reentry.

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