

Concept of a future
High Pressure- Boiling Water Reactor (HP-BWR)

Frigyes Reisch
Nuclear Power Safety, Department of Physics
School of Engineering Sciences
KTH, Royal Institute of Technology
Stockholm, Sweden
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Concept of a future High Pressure- Boiling Water Reactor (HP-BWR)

Combines the advantages and leaves out the disadvantages of the traditional BWRs and PWRs by using the experiences gained during the operation of more than four hundred reactors over three decades.

Gravity operated control rods

Large space for the cross formed control rods between fuel boxes

Bottom of the reactor vessel without numerous control rod penetrations

All the pipe connections to the reactor vessel are well above the top of the reactor core, no core spray is needed

Internal circulation pumps

Improved thermal efficiency, feeding the turbine with ~340 °C (15 MPa) steam instead of ~285 °C (7MPa)

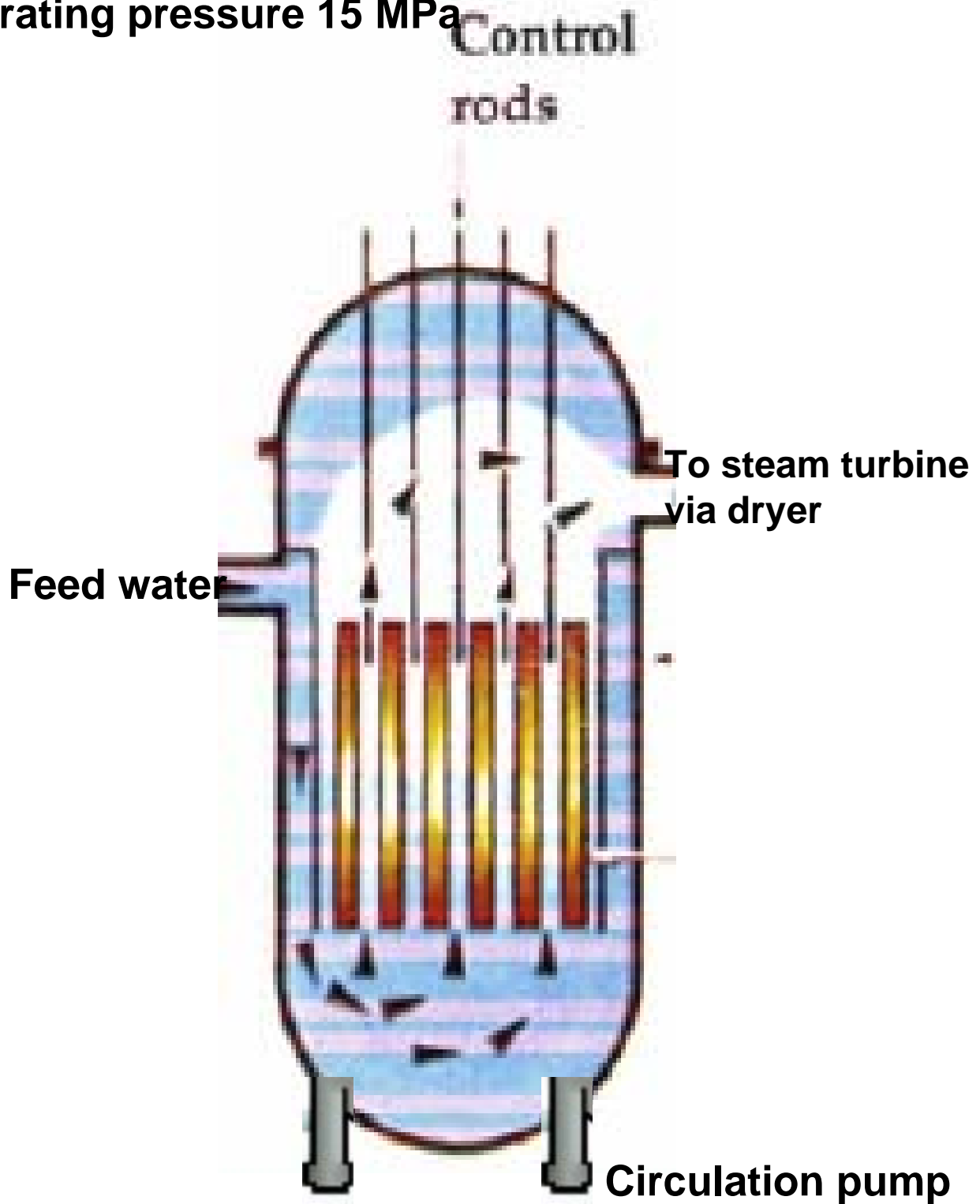
Direct cycle no need for steam generators

Separate steam dryers outside the reactor vessel

Simple dry containment

The High Pressure- BWR

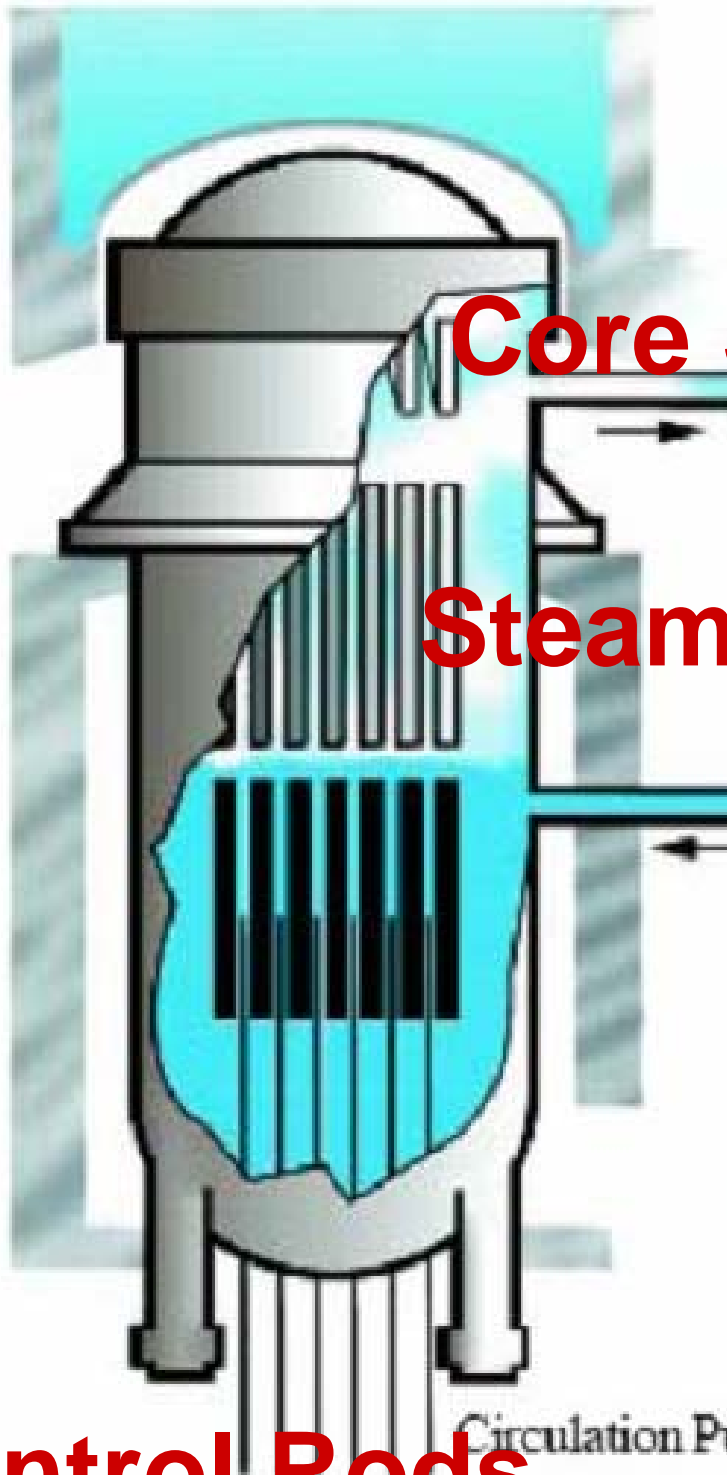
Operating pressure 15 MPa



Traditional BWR

Reactor

Operating pressure 7 MPa



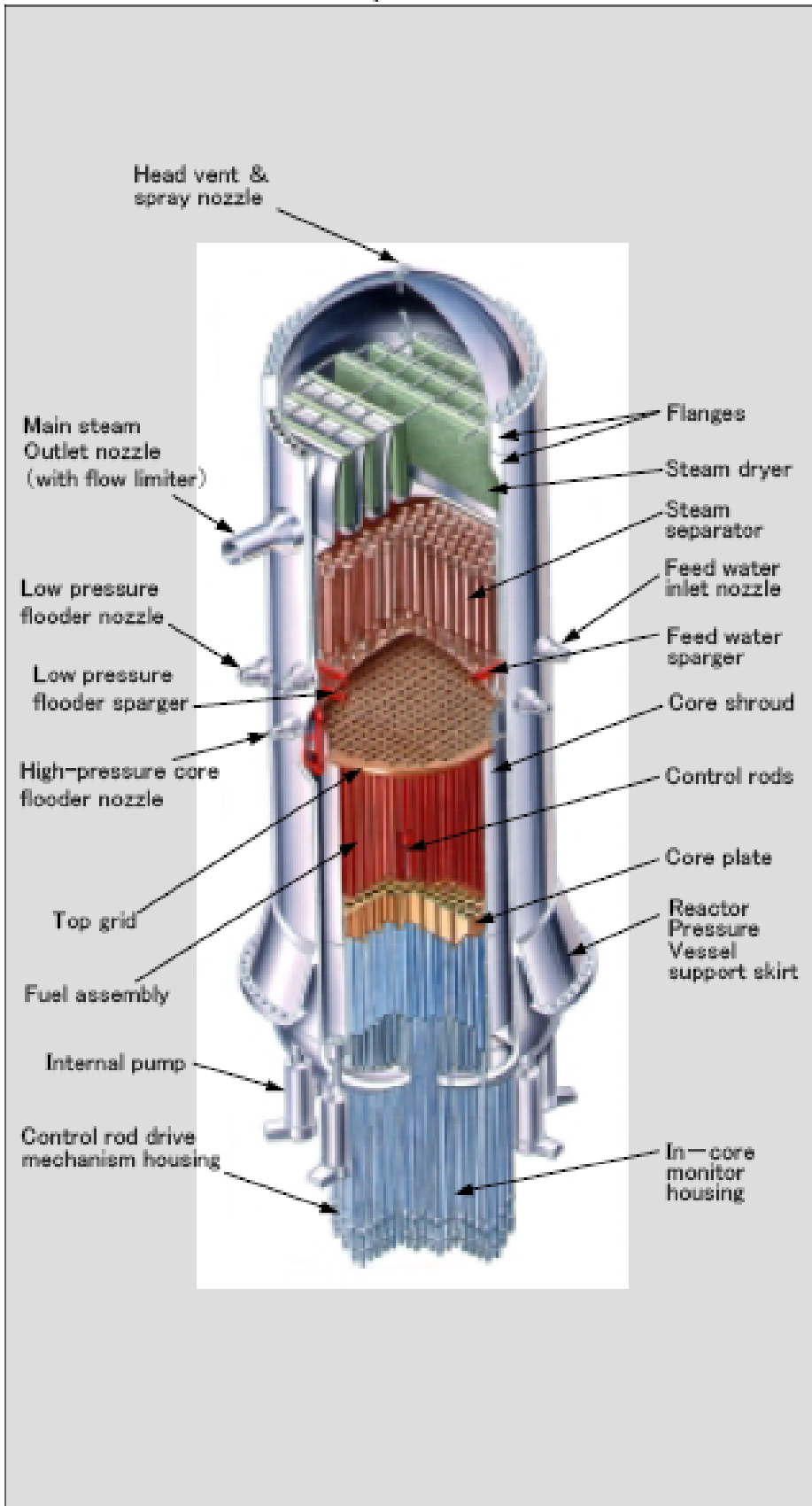
Core Spray

Steam dryer

Control Rods

Circulation Pt

Structural sketch of reactor pressure vessel



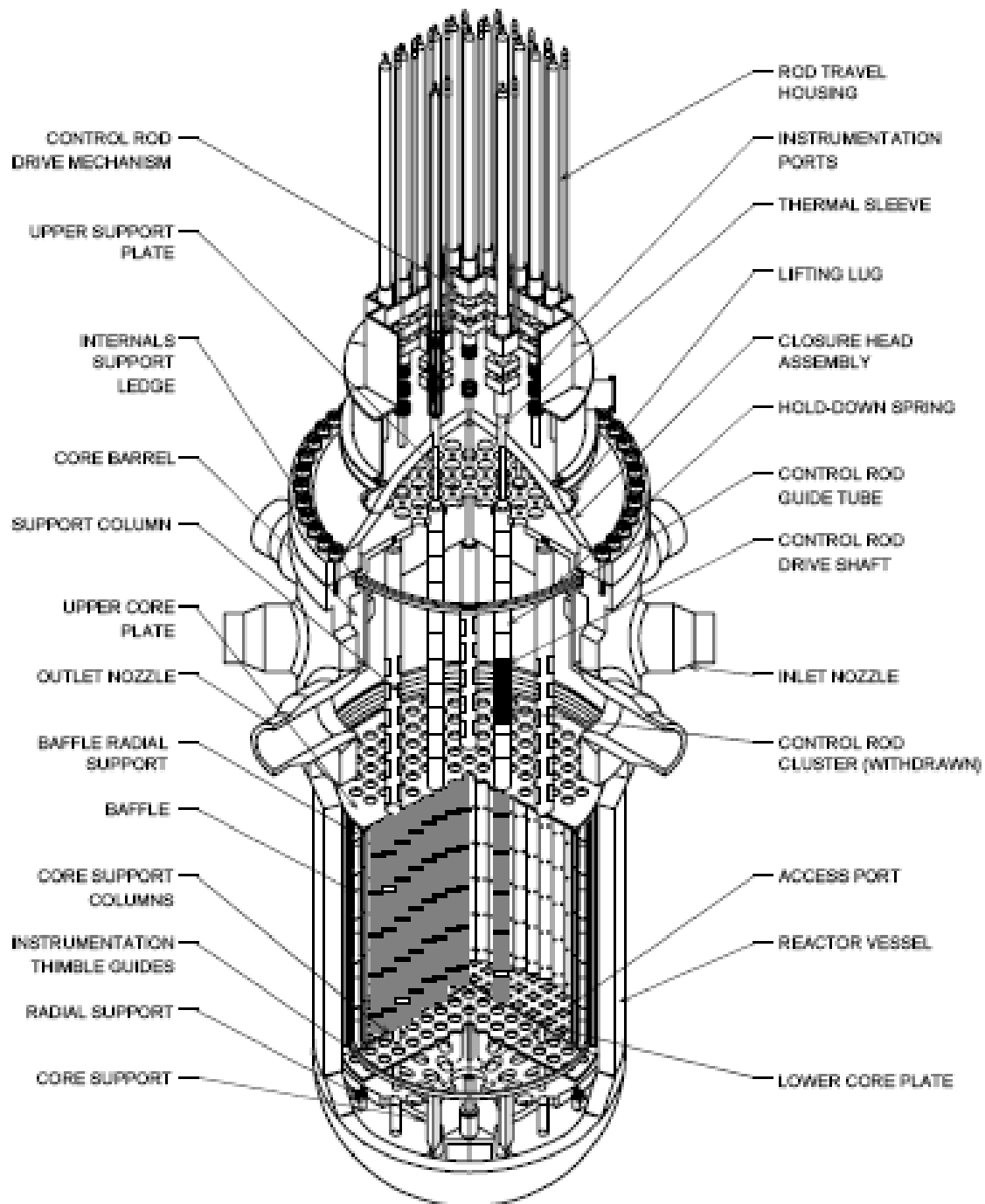
Traditional Advanced Boiling Water Reactor (Hitachi-ABWR)

Traditional PWR

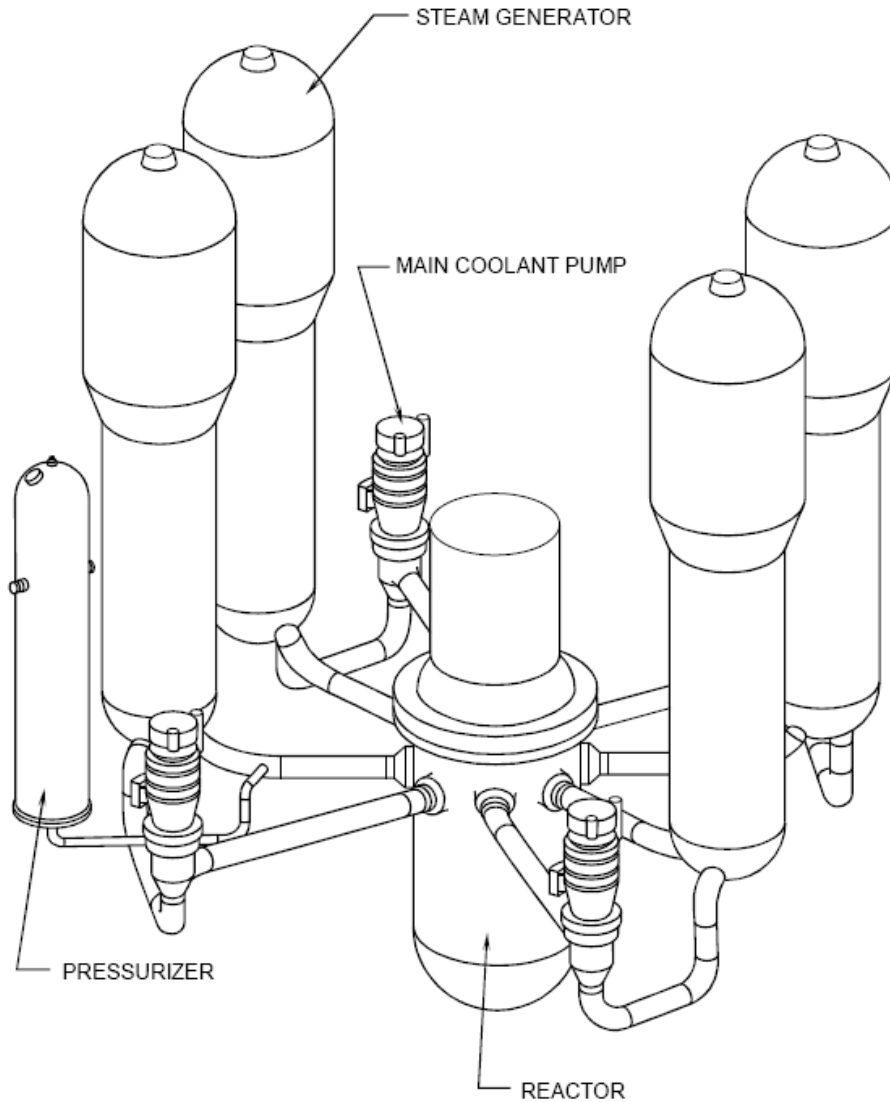
Operating pressure 15 MPa

Control rods





Cutaway View of Reactor Vessel



A four-loop Westinghouse plant has four steam generators, four reactor coolant pumps, and a pressurizer. The four-loop units in the United States are Braidwood 1 and 2, Byron 1 and 2, Callaway, Catawba 1 and 2, Comanche Peak 1 and 2, D. C. Cook 1 and 2, Diablo Canyon 1 and 2, Indian Point 2 and 3, McGuire 1 and 2, Millstone 3, Salem 1 and 2, Seabrook, Sequoyah 1 and 2, South Texas Project 1 and 2, Vogtle 1 and 2, Watts Bar 1, and Wolf Creek. Each of these plants has 193 fuel assemblies arranged inside a reactor vessel that has an internal diameter of 173 inches (except South Texas has an internal diameter of 167 inches). The fuel assemblies are arranged in 17 x 17 array except for Cook and Indian Point, which have 15 x 15 fuel. The electrical output of these plants ranges from 950 to 1250 megawatts.

Steam dryer in a SG

