

generation

*m***Power**

Reactor Pressure Vessel (RPV) Internals

September 17, 2013
(Redacted Version)

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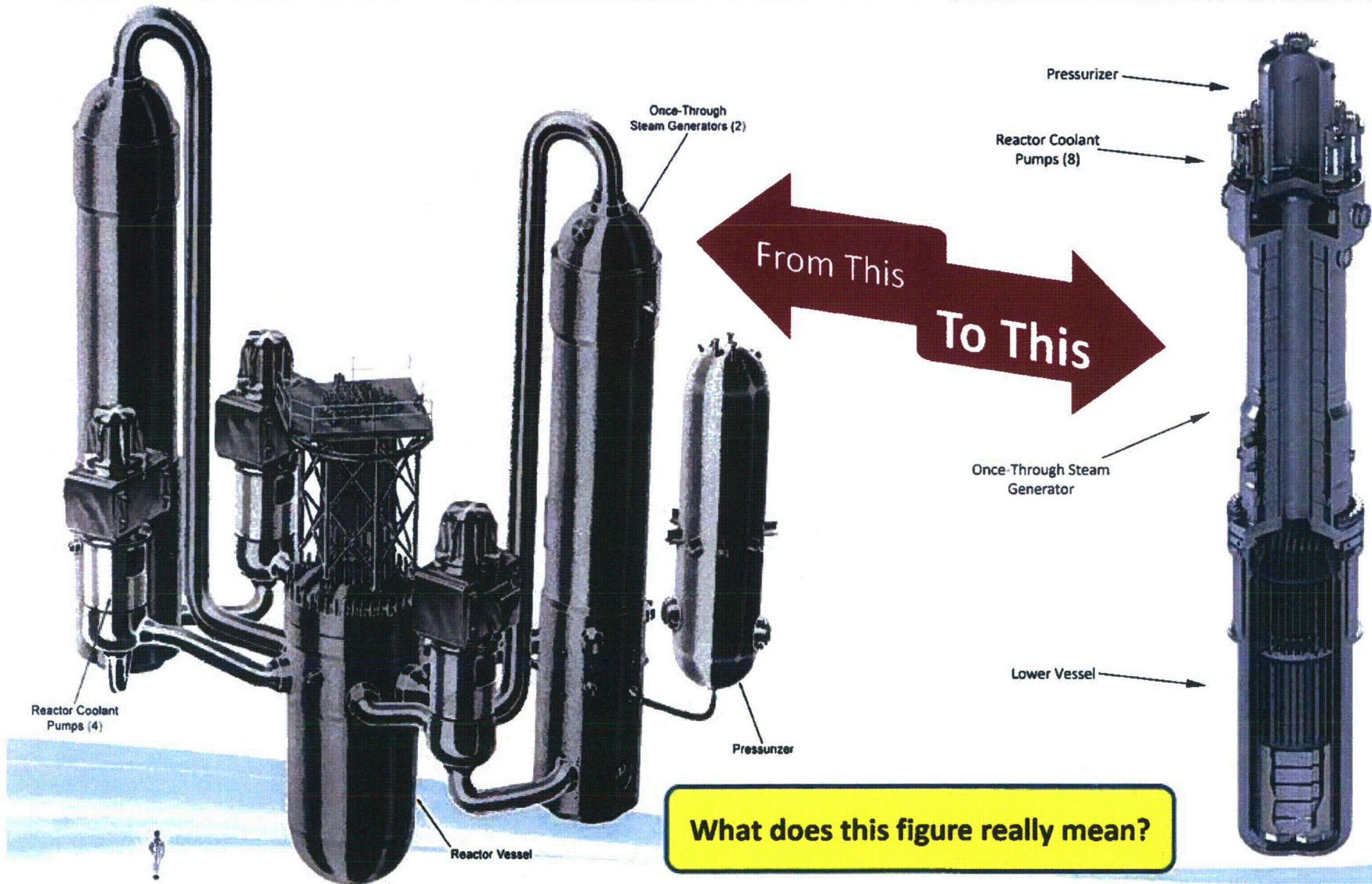
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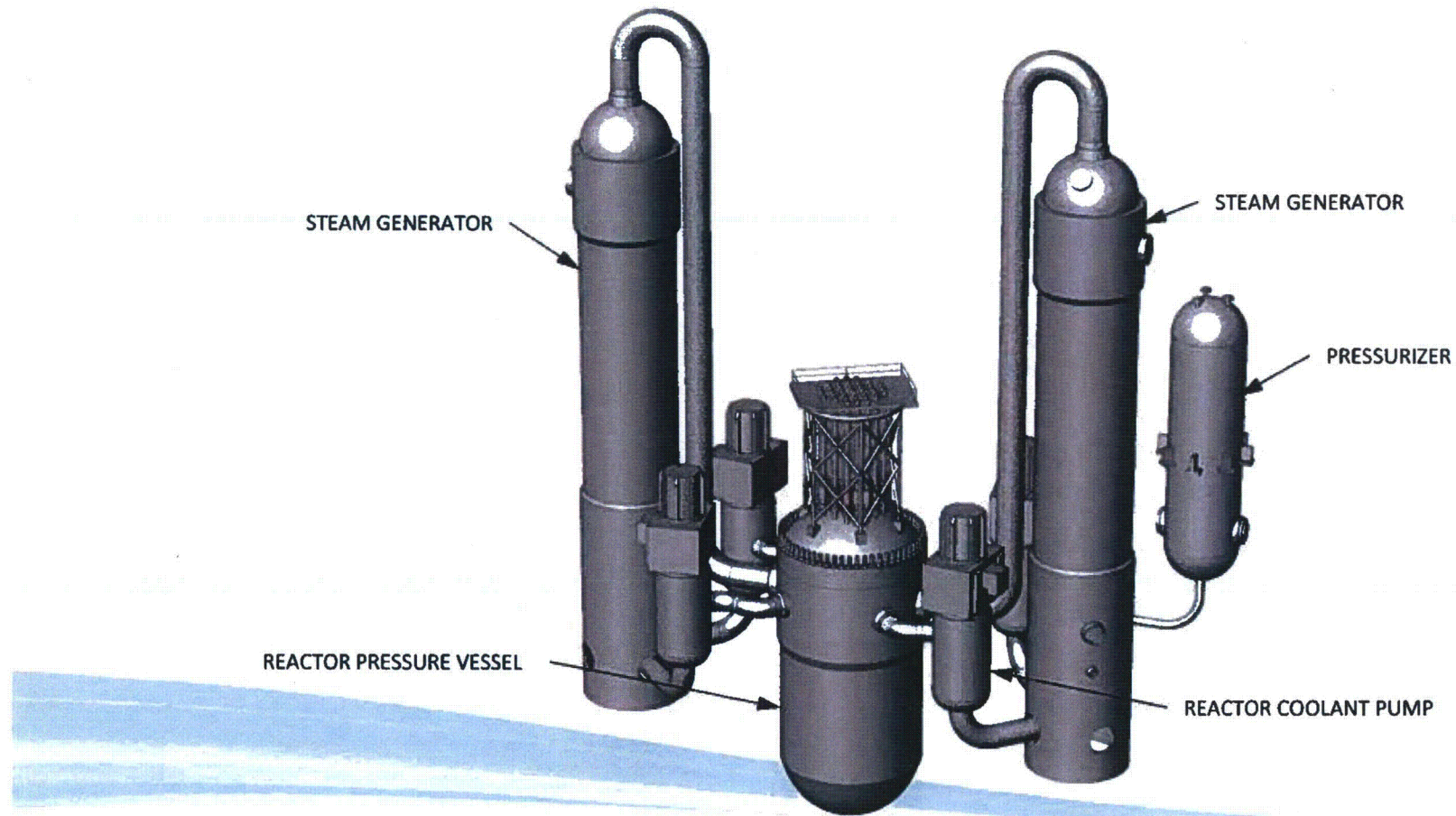
MU3266R196

- Overview of the mPower™ reactor design
- Definition of the Reactor Pressure Vessel (RPV) internals
- ASME Code classification of RPV internals
- Achieve alignment of terminology between mPower and NRC

Integral Reactor Definition

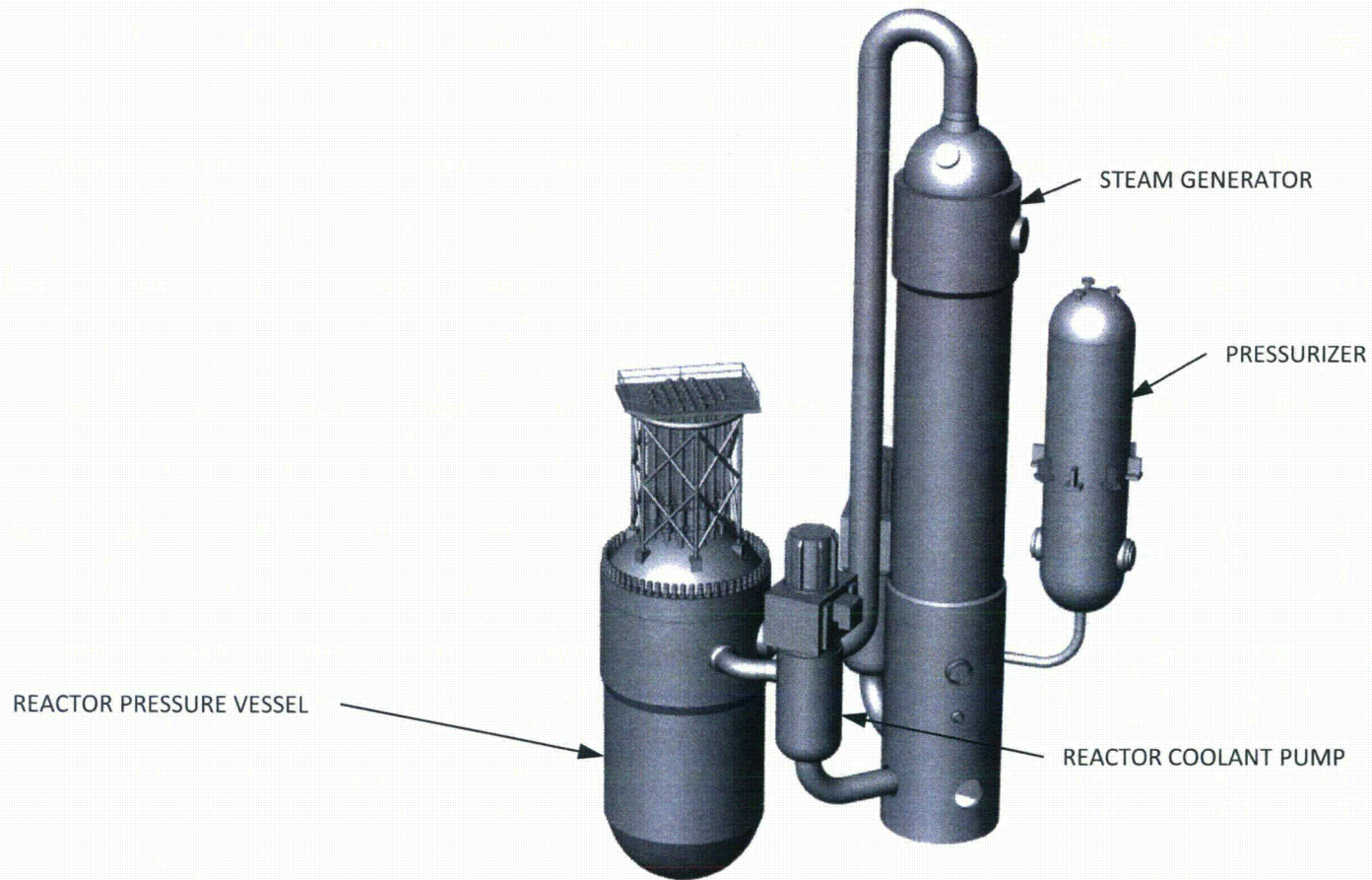


Traditional Reactor



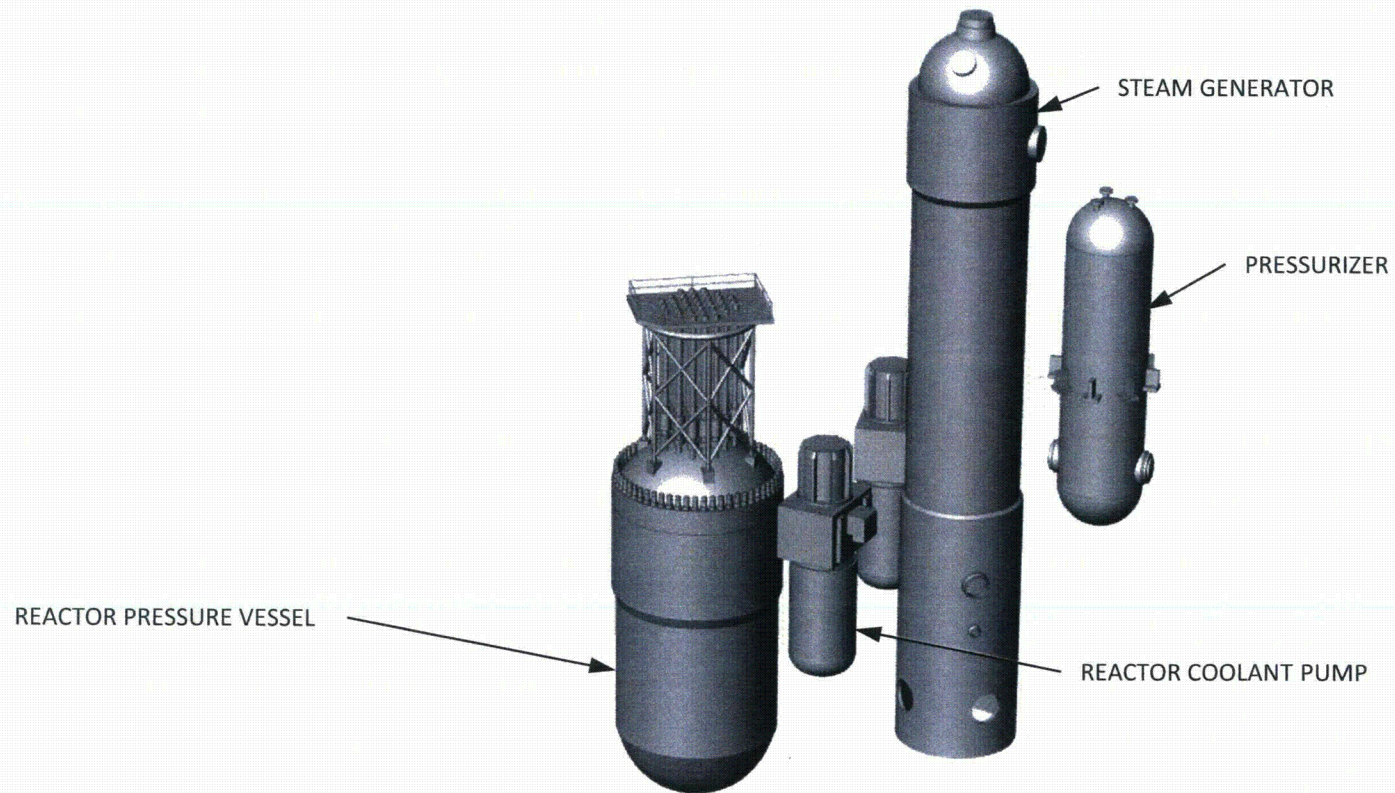
Reactor Evolution

- Single loop



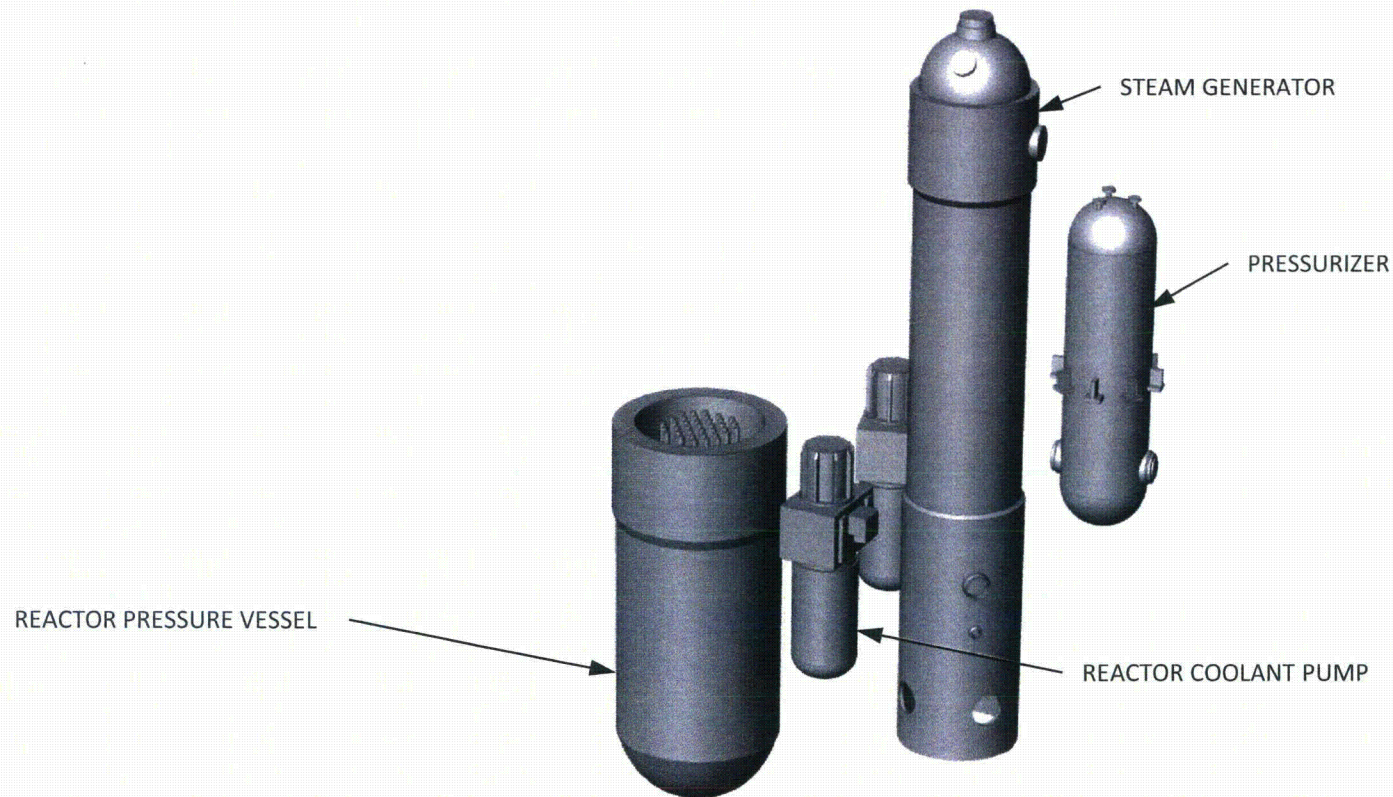
Reactor Evolution

- Single loop
- No loop piping



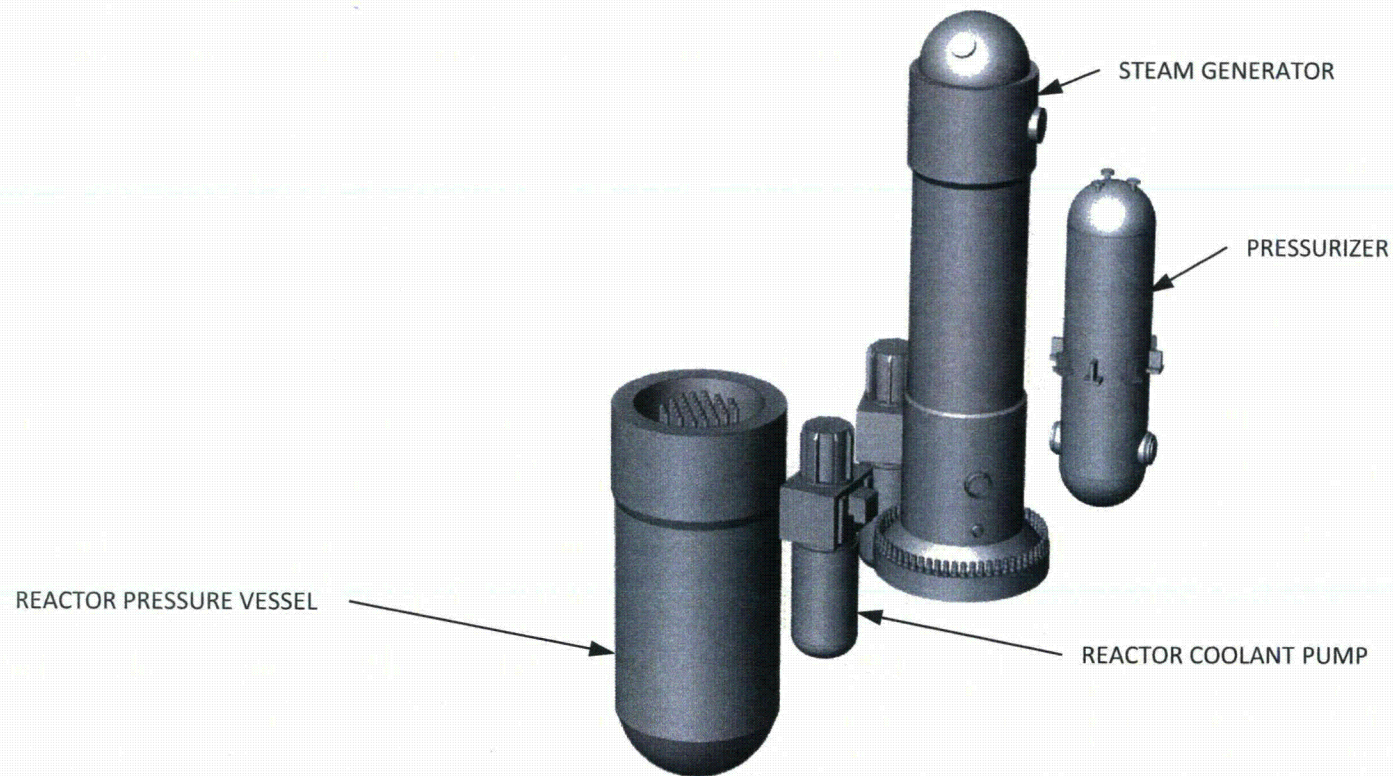
Reactor Evolution

- Single loop
- No loop piping
- Internal CRDMs



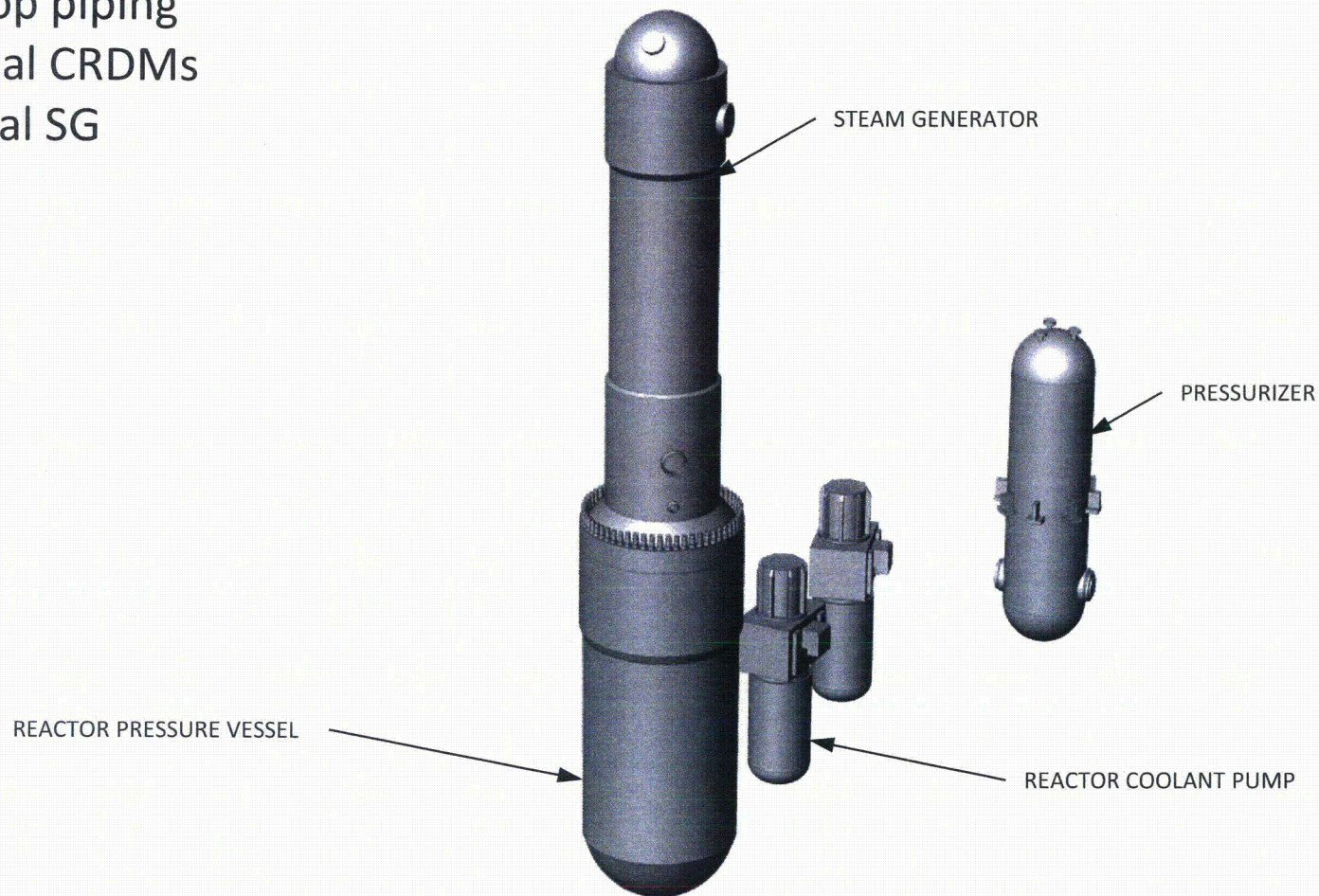
Reactor Evolution

- Single loop
- No loop piping
- Internal CRDMs
- Integral SG



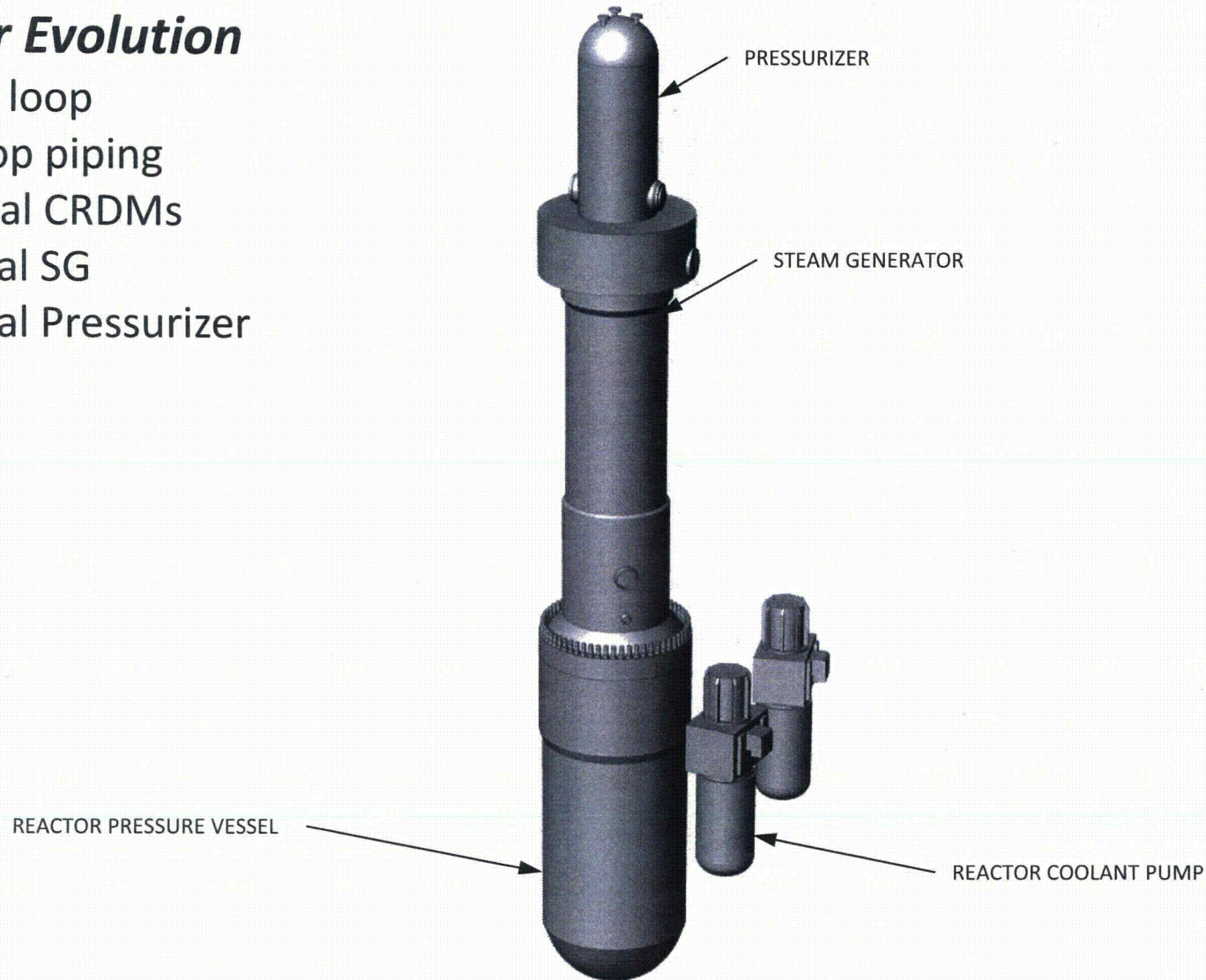
Reactor Evolution

- Single loop
- No loop piping
- Internal CRDMs
- Integral SG



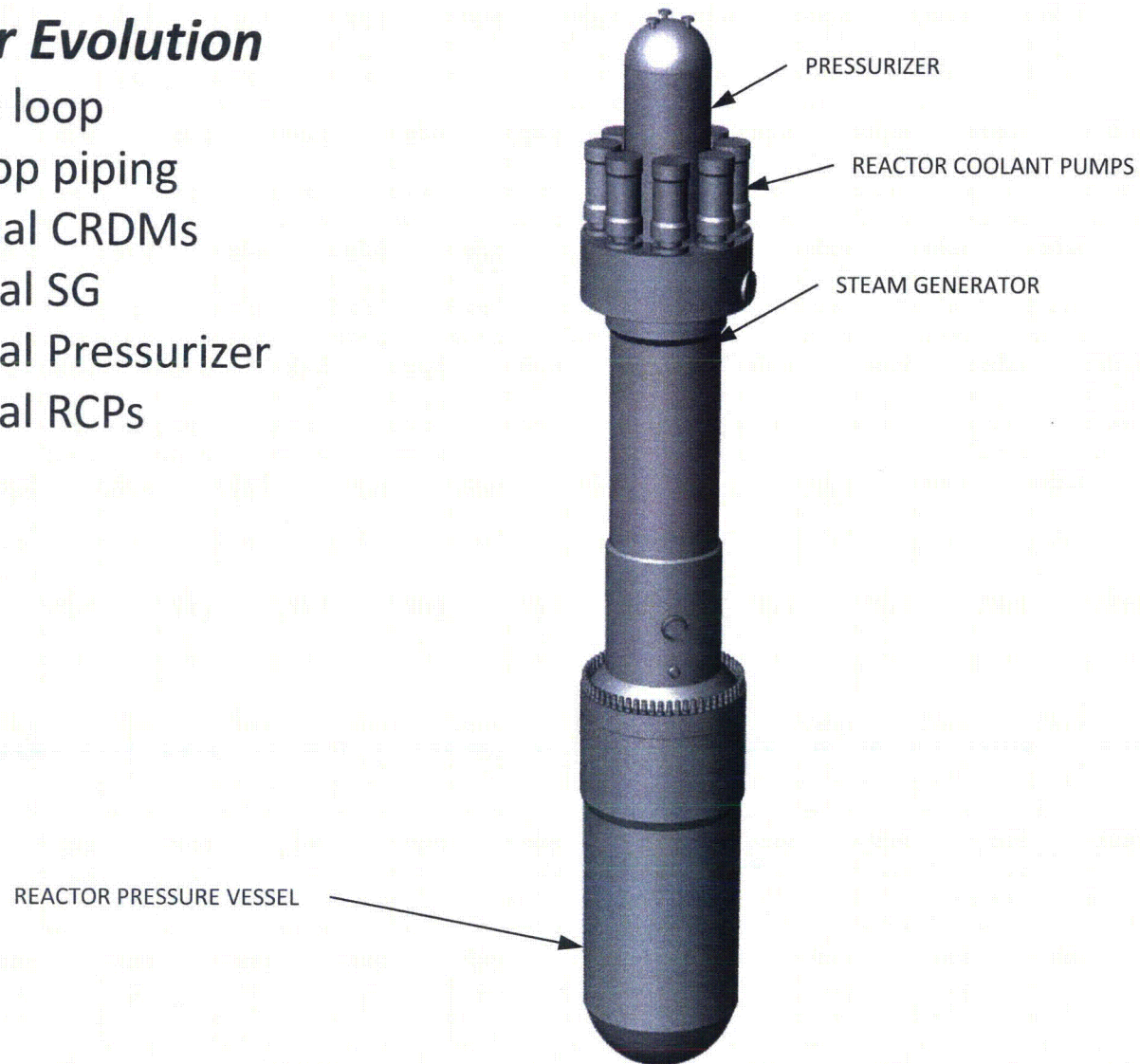
Reactor Evolution

- Single loop
- No loop piping
- Internal CRDMs
- Integral SG
- Integral Pressurizer



Reactor Evolution

- Single loop
- No loop piping
- Internal CRDMs
- Integral SG
- Integral Pressurizer
- Integral RCPs



B&W mPower Reactor [

- Single loop
- No loop piping
- Internal CRDMs
- Integral SG
- Integral Pressurizer
- Integral RCPs
- Integral Isolation Valves

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Overview of the mPower Reactor

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Reactor Component Breakdown

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**B&W mPower REFERS TO THE OVERALL
ASSEMBLY OF THESE COMPONENTS AS
THE REACTOR**

RPV Lower Internals (Core Support Structure)

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Primary

Secondary

Definition of RPV Internals

- Consistent with SRP 3.9.5, the term "reactor internals" includes core support and other internal structures and refers to all structural and mechanical elements inside the RPV
 - For the mPower reactor, the RPV is the lower vessel
 - Does not include:
 - The upper vessel (including the steam generator, riser, pressurizer, and RCPs), which will be addressed in DCD Section 5.4
 - Reactor fuel elements which will be addressed in DCD Chapter 4
 - Control rod drive elements which will be addressed in DCD Section 3.9.4

ASME Code Classification of Reactor Internals

Component	Classification ¹
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Notes:

- 1. CS – Core Support Structure
- IS – Internal Structure
- NB – Class 1 Pressure Boundary

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- For the mPower reactor, the RPV is the lower vessel
- Comments provided on DSRS 3.9.5 consistent with the mPower design