



ECCS Suction Strainers Overview of PWR and BWR NSSS Conditions & Containment Features

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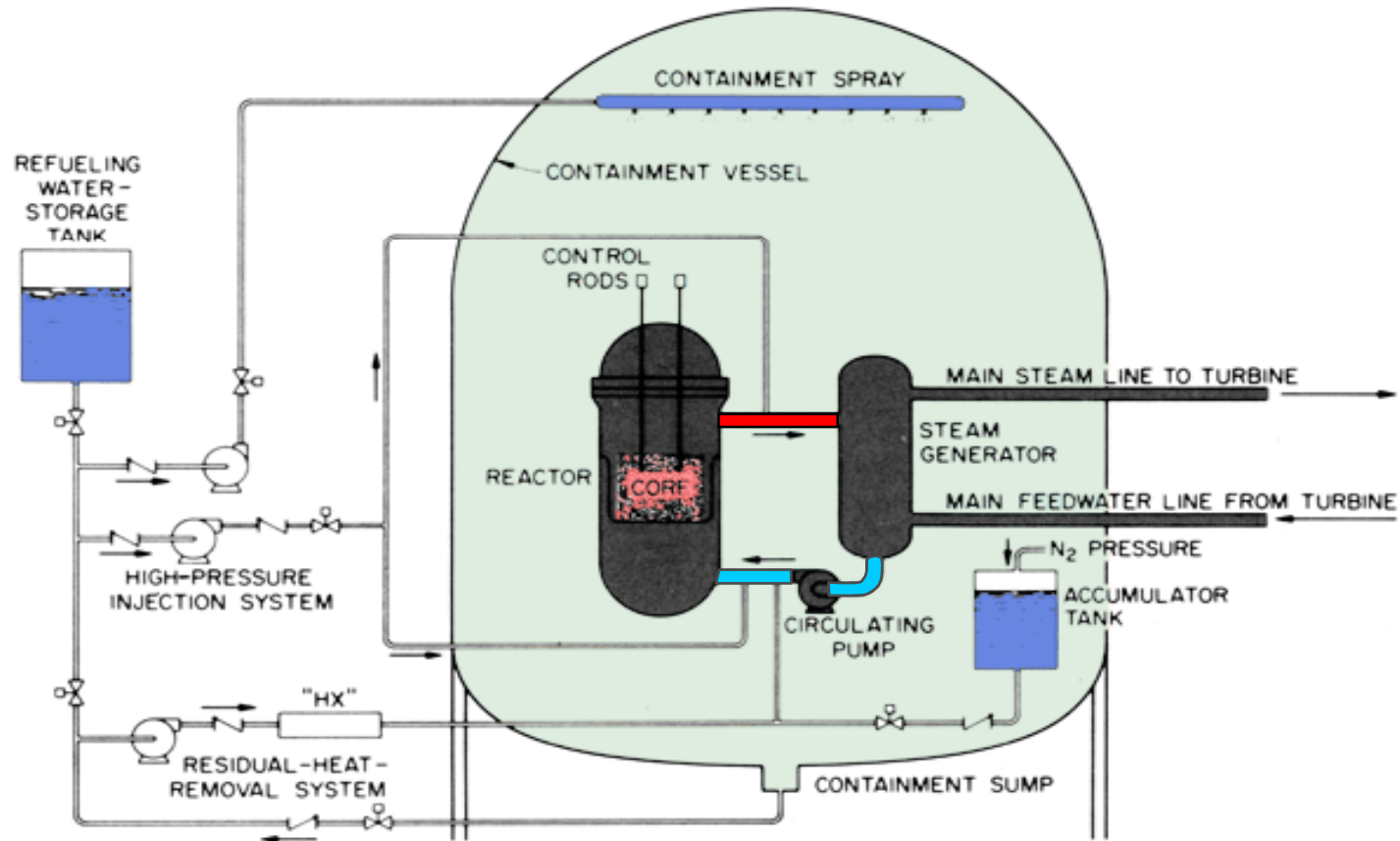
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PWR NSSS

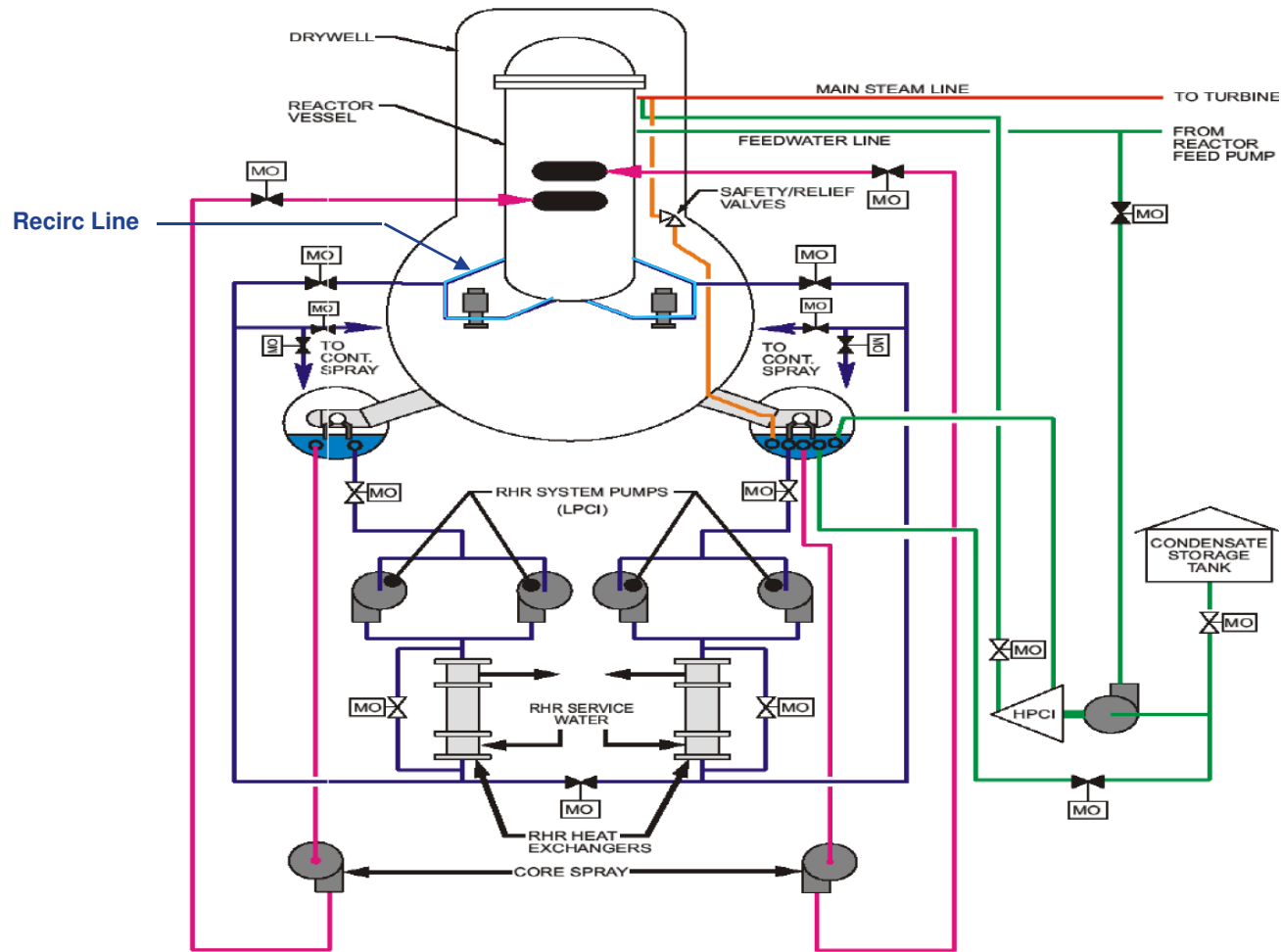
Figure 2. Schematic of PWR Emergency Core-Cooling System

Nuclear Safety, January-February 1974, p. 32



BWR NSSS

EMERGENCY CORE COOLING SYSTEMS



PWR vs BWR NSSS Conditions

PWR

Cold Leg: ~2250 psia, 540 F (~ 110 F subcooled)

Hot Leg: ~2250 psia, 630 F (~ 20 F subcooled)

Water chemistry: Boric acid water chemistry for reactivity trim; buffer added for pH control after LOCA

BWR

Recirculation line: 1060 psia, 535 F (~ 20 F subcooled)

Main Steam Line: 1040 psia, 540 F (dry saturated steam)

Water chemistry: Continuous de-ionization; some plants may inject sodium pentaborate to reduce alternate source term after LOCA

PWR vs BWR Containment Features

PWR

Largest pipe diameter: ~ 36 inch

ECCS primary water sources: accumulators, RWST, switch to sump suction at about 20 minutes for design-basis LOCA

Containment style: Large volume dry containments with ECCS suction at lowest point

BWR

Largest pipe diameter: ~ 28 inch

ECCS primary water sources: suppression pool, some plants also start early suction from Condensate Storage Tank. ECCS suction starting in less than a minute for design-basis LOCA

Containment style: Small volume pressure suppression drywell vents to suppression pool

PWR vs BWR Comparison

Debris generation

- BWR ZOIs are smaller than PWR ZOIs because of lower pressures and smaller diameter pipes

Water chemistry

- BWR water is demineralized and does not use borated water or buffers to control reactor power
- Sodium pentaborate may be injected later in a design basis LOCA by some BWRs to reduce alternate source term

ECCS Systems

- BWRs have multiple independent high and low pressure ECCS injection paths