

on the part of the petition regarding the request to amend the regulations in § 50.44 to allow the use of other zirconium-based alloys in addition to those specified in the current regulations. The NRC will evaluate that portion of the NEI petition in a separate action.

## VII. Section-by-Section Analysis of Substantive Changes

### *Section 50.34—Contents of Applications; Technical Information*

Paragraph (a)(4) on ECCS performance is revised to reference the reactor coolant system high point venting requirements located in § 50.46a. These requirements were relocated to § 50.46a from § 50.44.

Paragraph (g) is redesignated as paragraph (h) and a new paragraph (g) is added, that requires applications for future reactors to include the analyses and descriptions of the equipment and systems required by § 50.44.

### *Section 50.44—Combustible Gas Control in Containment*

Paragraph (a), *Definitions*. Paragraph (a) adds definitions for two previously undefined terms, “mixed atmosphere,” and “inerted atmosphere.”

Paragraph (b), *Requirements for currently-licensed reactors*. This paragraph sets forth the requirements for control of combustible gas in containment for currently-licensed reactors. All BWRs with Mark I and II type containments are required to have an inerted containment atmosphere, and all BWR Mark III type containments and PWRs with ice condenser type containments are required to include a capability for controlling combustible gas generated from a metal water reaction involving 75 percent of the fuel cladding surrounding the active fuel region (excluding the cladding surrounding the plenum volume) so that there is no loss of containment integrity. Current requirements in § 50.44(c)(i), (iv), (v), and (vi) are incorporated in to the amended regulation without substantial change. Previously reviewed and installed combustible gas control mitigation features to meet the existing regulations are considered to be sufficient to meet this section. Because these requirements address beyond design-basis combustible gas control, it is acceptable for structures, systems, and components provided to meet these requirements to be non safety-related and may be procured as commercial grade items.

Paragraph (b)(1), *Mixed atmosphere*. The requirement for capability ensuring a mixed atmosphere in all containments

is consistent with the current requirement in § 50.44(b)(2) and does not require further analysis or modifications by current licensees. The intent of this requirement is to maintain those plant design features (e.g., availability of active mixing systems or open compartments) that promote atmospheric mixing. The requirement may be met with active or passive systems. Active systems may include a fan, a fan cooler, or containment spray. Passive capability may be demonstrated by evaluating the containment for susceptibility to local hydrogen concentration. These evaluations have been conducted for currently licensed reactors as part of the IPE program.

Paragraph (b)(3) retains the existing requirements for BWR Mark III and PWR ice condenser facilities that do not use inerting to establish and maintain safe shutdown and containment structural integrity to use structures, systems, and components capable of performing their functions during and after exposure to hydrogen combustion.

Paragraph (b)(4)(i) codifies the existing regulatory practice of monitoring oxygen in containments that use an inerted atmosphere for combustible gas control. The rule does not require further analysis or modifications by current licensees but certain design and qualification criteria are relaxed. The rule requires that equipment for monitoring oxygen be functional, reliable and capable of continuously measuring the concentration of oxygen in the containment atmosphere following a beyond design-basis accident. Equipment for monitoring oxygen must perform in the environment anticipated in the severe accident management guidance. The oxygen monitors are expected to be of high-quality and may be procured as commercial grade items. Existing oxygen monitoring commitments for currently licensed plants are sufficient to meet this rule.

Paragraph (b)(4)(ii) retains the requirement in § 50.44(b)(1) for measuring the hydrogen concentration in the containment. The rule does not require further analysis or modifications by current licensees but certain design and qualification criteria are relaxed. The rule requires that equipment for monitoring hydrogen be functional, reliable and capable of continuously measuring the concentration of hydrogen in the containment atmosphere following a significant beyond design-basis accident of comparable severity to the accident at Three Mile Island. Equipment for monitoring hydrogen must perform in the environment anticipated in the

severe accident management guidance. The hydrogen monitors may be procured as commercial grade items. Existing hydrogen monitoring commitments for currently licensed plants are sufficient to meet this rule.

Paragraph (b)(5) retains the current analytical requirements in § 50.44(c)(3)(iv) that BWR Mark III and PWR ice condenser containments be provided with a hydrogen control system justified by a suitable program of experiment and analysis that can handle without loss of containment integrity an amount of hydrogen equivalent to that generated by a metal-water reaction involving 75 percent of the fuel cladding surrounding the active fuel. Existing licensee hydrogen control systems and analyses are expected to be sufficient to demonstrate compliance with this requirement.

Paragraph (c), *Requirements for future water-cooled reactor applicants and licensees*. Paragraph (c) promulgates requirements for combustible gas control in containment for all future water-cooled reactor construction permits or operating licenses under Part 50 and for all water-cooled reactor design approvals, design certifications, combined licenses, or manufacturing licenses under Part 52, whose reactor designs have comparable potential for the production of combustible gases as current light water reactor designs. The current requirements in § 50.34(f)(2)(ix) and (f)(3)(v) are retained without material change, but have been consolidated and reworded to be more concise. Paragraph (c)(1) requires a mixed containment atmosphere during design-basis and significant beyond design-basis accidents. This wording was chosen to specify a mixed atmosphere requirement during important accident scenarios similar to the current requirements for PWR and BWR containments. Paragraph (c)(2) requires all containments to have an inerted atmosphere or limit hydrogen concentrations in containment during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100 percent fuel-clad coolant reaction, uniformly distributed, to less than 10 percent and maintain containment structural integrity and appropriate accident mitigating features. Structures, systems, and components (SSCs) provided to meet this requirement must be designed to provide reasonable assurance that they will operate in the severe accident environment for which they are intended and over the time span for which they are needed. Equipment survivability expectations under severe accident conditions should consider the