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# **Regulatory Issues Related to the Examination of Cast Austenitic Stainless Steel**

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## Regulatory Requirements

- General Design Criteria-32 “Inspection of reactor coolant pressure boundary.” Components which are part of the reactor coolant pressure boundary shall be designed to permit (1) periodic inspection and testing of important areas and features to assess their structural and leaktight integrity, and (2) an appropriate material surveillance program for the reactor pressure boundary pressure vessel.
- 10 CFR 50.55(a) incorporates ASME Code Section XI by reference. The Code requires inspection of welds adjacent to cast components.

## Background

- Inspection is an integral aspect of defense-in-depth.
- Inspection requirements exist for components even when there are no known active degradation mechanism.
- Inspection are performed to monitor for the absence of active degradation or, if degradation occurs, to demonstrate integrity until the next inspection.
- Ability to inspect components is necessary to achieve these goal.

## Background

- CASS components are in safety significant locations in reactor coolant system.
- Though operational experience has not identified failures, longer-term operation may present issues with embrittlement mechanisms or potentially with SCC.

## Regulatory Issues

- CASS components on one side of a weld may interfere with the ability to inspect a weld resulting in coverage and quality issues.
- Single-sided exam leads to lower robustness and potentially missed indications.
- Geometry on the accessible side can challenge coverage.

## Regulatory Issues

- For the CASS components themselves, inspections are required; however, the inspections do not provide useful information and, currently, cannot be qualified.
- Variety of components:
  - Piping, surge lines, pump bowls, safe ends
    - Single-sided and “no-sided” exams (where castings are on both sides of the weld).
  - Cast internal components
    - Not a requirement to inspect now; however, in license renewal arena, there are postulated degradation mechanisms which may lead to a need for inspection.

## Summary

- Potential for new degradation mechanisms in CASS components could challenge structural integrity and functionality of the reactor coolant system.
- The inability to inspect CASS components challenges our ability to demonstrate the structural integrity of plants.