

## Baffle Bolt Services

### Background

Irradiation assisted stress corrosion cracking of reactor vessel internals is an important consideration as nuclear plants reach extended lifetimes. One component that is critical to maintaining the structural integrity of the internals and that has been shown to be susceptible to aging mechanisms is the baffle-to-former bolts (or baffle bolts). The stainless steel baffle bolts attach the vertical baffle plates to the horizontal former plates within the internals.

### Single Source for Baffle Bolt Aging Management

- Planning
- Inspection
- Analysis
- Replacement

### Description

#### Proactive Contingency Planning

Upfront planning is critical to a successful bolt replacement strategy. Timing is an important consideration since lead times can exceed nine months depending on the scope of work. Westinghouse can develop a plan that addresses immediate concerns and creates a cost-effective strategy for continued operations.

#### Baffle Bolt Inspection

The inspection service provides specific options to address the guidelines identified by MRP-227-A. Inspection capabilities include visual and enhanced visual examinations, direct physical measurements and volumetric examinations of the primary components.

#### Did you know?

- ✓ The inspection process not only looks at the bolt head but also deep into the threads
- ✓ The ultrasonic inspection techniques cover all baffle-former bolt designs

### Baffle Bolt Analysis

The analysis consists of a detailed modeling of the internals and evaluation of the thermal-hydraulic loads on the baffle bolts during normal, upset and faulted conditions to

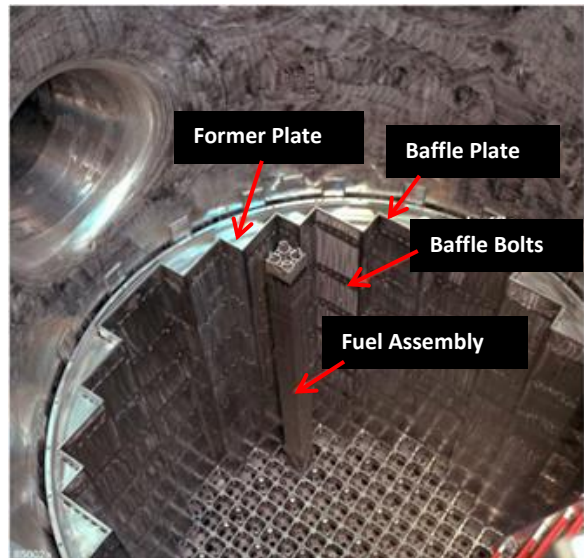
define maximum loads on bolts with varying numbers and distributions of intact bolts.

Westinghouse's Acceptable Bolting Pattern Analysis (ABPA) provides the most versatility

for analyzing the plant's as-found condition and the ability to react quickly if repairs are necessary.

#### Did you know?

- ✓ The ABPA can significantly reduce outage delays by justifying continued operation with degraded bolts
- ✓ The Westinghouse ABPA is the only analysis approved by the NRC
- ✓ Results are valid for long-term operations in most cases



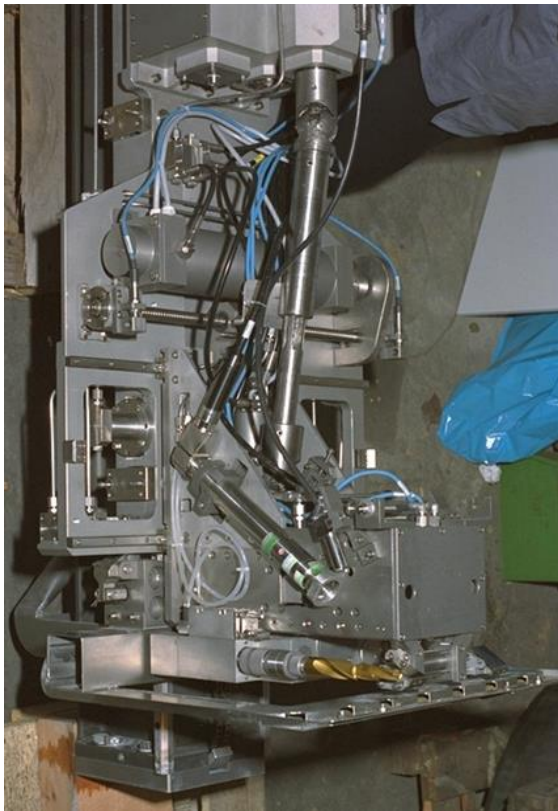
Reactor Core Arrangement

## Baffle Bolt Replacement Services

Since 1985, Westinghouse has globally replaced more than 2,950 baffle bolts. We have performed more than 23 replacement campaigns and have provided contingency planning for an additional 16 plants. Our tooling and equipment is fifth generation and able to adapt to multiple scenarios including degraded, shifted or galled bolts. Our rate of replacement has been proven and documented. In one instance, 157 bolts were replaced in less than 15 days (six days ahead of schedule) and more recently the replacement rate has averaged 10 to 12 bolts per day.

### Did you know?

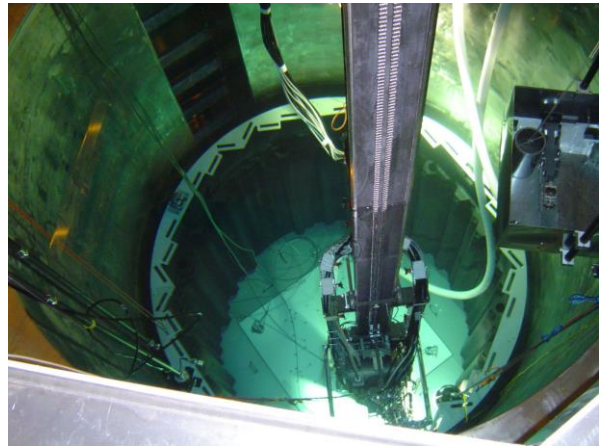
- ✓ Tested and proven tooling with more than 30 years' experience
- ✓ Experienced staff capable of resolving numerous failure scenarios
- ✓ OEM knowledge to quickly address issues
- ✓ New bolting design resistant to future degradation



*Baffle Bolt Tooling Head*

## Benefits

As a global leader in the long-term management of aging reactor internals, Westinghouse is a trusted and proven single-solution partner to address the irradiation-assisted stress corrosion cracking of baffle bolts. Working with more than 14 utilities and having more than 30 years of experience in baffle bolt analysis, inspection and replacement services, Westinghouse is your trusted reactor internals aging partner. Utilities will experience a seamless project approach that helps deliver the "Nuclear Promise" thanks to our effective and rapid response to planned and unplanned circumstances.



*Baffle Bolt Replacement Equipment*