

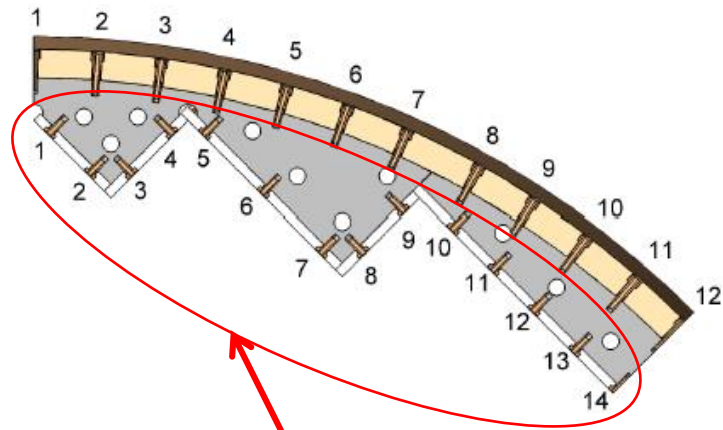
AREVA

Baffle-to-Former Bolt Customer Service Bulletin No. 16-02

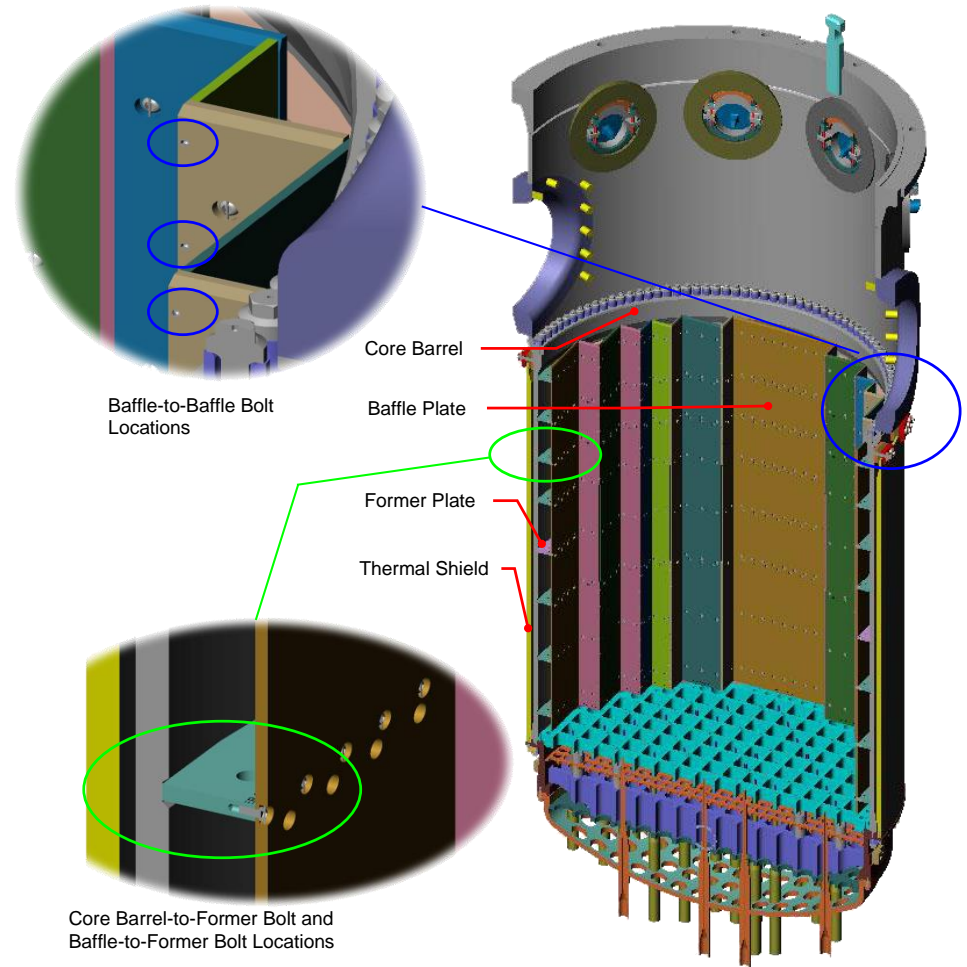
S. Fyfitch, AREVA Inc.



B&W-Design Baffle-Former Assembly



Baffle-to-Former Bolt Locations (1/8th core)



B&W-Designed RV Internals Operating Experience

- ▶ **Four baffle-to-former bolt (BFB) UT examinations completed at B&W-designed units to date**
 - ◆ One BFB out of 3,450 BFBs UT examined identified with crack-like indications
 - ◆ VT examinations of all 3,456 BFBs identified no relevant indications
- ▶ **Concluded there is very high probability this was a random failure and not an indication of active degradation mechanism having initiated**

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- ▶ **Customer Service Bulletin released July 14, 2016**
- ▶ **Subject:**
 - ◆ **Preliminary evaluation of relevance of recent BFB degradation at Westinghouse-designed 4-loop units to B&W-designed 177-FA units**
 - ◆ **Preliminary evaluation relative to risk to safety and operability of B&W-designed 177-FA units**

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► Conclusions:

◆ BFBs and baffle-to-baffle bolts (BBBs), regardless of RV internals design, are potentially susceptible to irradiation-assisted stress corrosion cracking (IASCC)

- Two primary factors affect IASCC
 - Accumulated fluence
 - Stress
- Several key stress drivers for IASCC
 - Relatively high stress due to reactor coolant design configuration (downflow vs. upflow)
 - Bolting installation and design characteristics
 - Bolt fabrication process
 - Bolt length
 - Bolt head-to-shank design
 - Initial torque levels

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▶ Conclusions (cont.):

- ◆ Very unlikely that failure rate leading to unacceptable BFB configuration could occur before performing next MRP-227 examinations (initial or subsequent) at any B&W-designed 177-FA unit
- ◆ Risk of observing OE similar to that seen at Westinghouse-designed units to date is low

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- ▶ **These recommendations are provided until further evaluation and assessment of current issue is completed through PWROG and industry BFB Focus Group:**
 - ◆ **It is recommended that B&W-designed 177-FA units continue to follow BFB and BBB (and BFB and BBB locking devices/locking weld) inspection guidelines of MRP-227 and implement any future MRP guidance changes**
 - ◆ **It is also recommended that B&W-designed 177-FA units maintain increased awareness of telltale signs of BFB and BBB degradation through continuation of existing activities:**
 - Evaluating reactor coolant radioactivity levels during fuel cycle
 - Performing loose parts monitoring and foreign object search and removal (FOSAR) examinations as part of normal refueling activities
 - Performing visual examinations of peripheral fuel assemblies currently identified for assessment of fuel performance
- ▶ **Additional details are provided in Customer Service Bulletin**

QUESTIONS

