

BAFFLE BOLTS INSPECTION

Flexible UT inspection systems with in-house manufactured probes, adaptable to various bolt head designs.

Framatome is the proven partner for examination and replacement of complex bolt heads. State of the art UT probes and UT systems provide detailed information on flaws, allowing optimized replacement patterns.

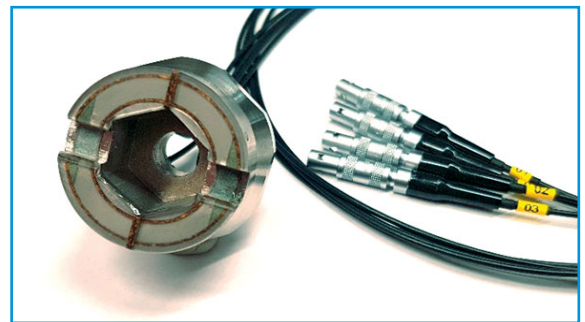
Challenge

Baffle bolt degradation has been detected in various PWRs around the world. For safety reasons, they need to be inspected and, if necessary, replaced. Since visual inspection is not sufficient to receive information about damaged shafts or threads, volumetric NDE methods, such as UT, have to be deployed to get information about the current condition of the bolts.

However, standard off-the-shelf UT inspection methods are not suitable for complex bolt head configurations.

Solution

Framatome provides full volumetric UT inspections on even complex baffle bolt designs, to identify potential defects in head, shaft and thread, also in case of tilted flaws. The inspection system consists of well-proven underwater manipulators and high-end UT systems. The manipulator position is camera-controlled, ensuring the identification and inspection of every single bolt. The UT probes and systems are produced at Framatome's in-house manufacturing facility and adapted to the particularities of the installed bolts. By understanding the current condition of the bolts and providing a justification based on Framatome's acceptable bolt pattern analysis, it is often feasible to continue plant operations and postpone bolt replacement. This avoids outage delays and allows for thoroughly planned replacement campaigns in future outages.



UT probe for inspection of complex baffle bolt geometries with locking bar

Customized UT probe manufacturing ensuring high adaptability

- Optimized probe design supported by UT soundpath simulation
- Special-purpose UT probes for R&D and feasibility studies
- Prototypes for the inspection qualification
- Manufacturing of ready-for-market probes and probe systems.

Customer benefits

- UT inspection of various baffle bolt designs, including
 - Star head bolts (including replacement bolt PENTARC)
 - Internal hexagonal head bolts
 - Internal hexagonal slotted head with locking bar
 - Round and hexagonal slotted head with locking bar
- Site-specific qualification, based on leading codes and requirements (KTA, ENIQ, EPRI MRP 228)

Applicable for a variety of other bolts such as clevis, key or barrel.

International experience on bolt inspection

- China
- Switzerland
- Netherlands
- U.S.
- Slovenia
- Germany
- Sweden

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