

Visual Inspection of RPV and RPV Internals with SUSI Submarine System

SUSI is the fastest and most flexible solution for visual inspection of reactor pressure vessel (RPV) and RPV internals. Our operators are also multi-qualified visual testing inspectors with professional experience in various nuclear power plant (NPP) designs.

Challenge

Performance of visual inspection of RPV and RPV internals is mandatory according to plant pre-service and in-service inspection programs.

Execution during outages on the critical path, where time pressure is an issue, calls for rapid performance without compromising precision and reliability. Time constraints also require efficient contingency tools for ad-hoc inspections or foreign object search and retrieval (FOSAR).

Lifetime extension programs will demand additional inspection scope to be performed.

Solution

SUSI is a multi-purpose device for underwater visual inspection of various reactor areas and additional applications.

Visual inspection of:

- RPV
- RPV internals
- Main coolant pumps
- Reactor coolant lines and other piping
- Pressurizer, accumulators and tanks (primary and secondary side)
- Steam generators (primary and secondary side)

Other applications:

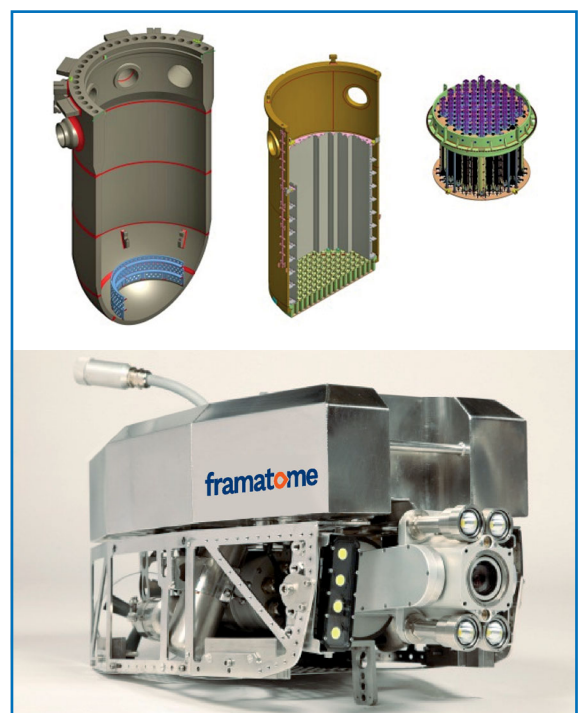
- Core mapping (verification)
- Observation of underwater component handling
- FOSAR

Visual inspection of RPV and RPV internals using SUSI is performed by our highly qualified and experienced inspection personnel certified according to DIN EN ISO 9712 and ASNT/ANSI CP-189.

The universally applicable multi-purpose equipment family allows flexible use based on customer needs.

Customer benefits

- Time savings on the critical path thanks to rapid and highly reliable performance
- Improvement of plant safety and reliability
- Reduction of radiation exposure
- Outage optimization and therefore cost savings
- Support to component lifetime extension programs
- Decades of experience in outage services
- Field service worldwide



SUSI 420 submarine for RPV and RPV internals inspection

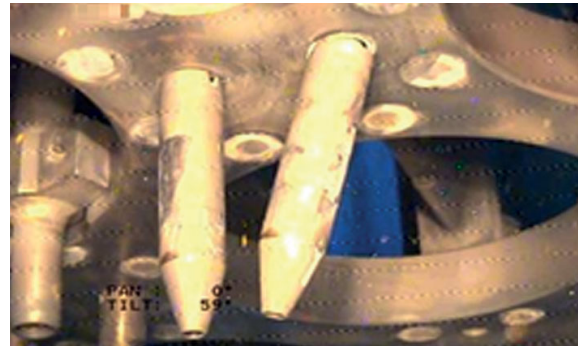
Your performance
is **our** everyday **commitment**

Technical information

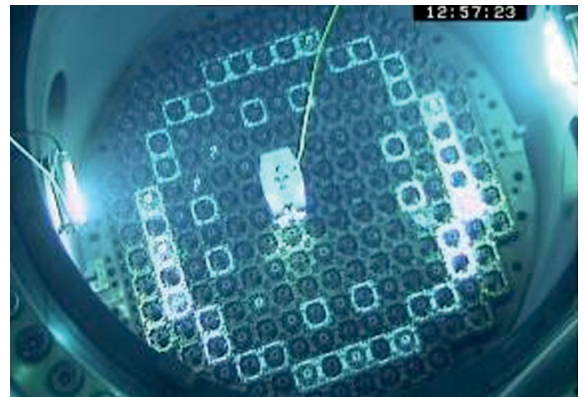
- Extremely stable platform for the highest picture quality
- High maneuverability with four axis of freedom
- Cameras and components are highly tolerant and resistant to radiation
- Flexible system with many application tools
- Rapid setup times
- Qualified according to several codes and standards
 - DIN 25435-4
 - KTA 3201.4
 - KTA 3204
 - MRP 227-A
 - ENIQ
 - ASME, Sec. XI
 - Customer-specific test instructions

Additional capabilities and add-ons

- CCD, tube and HD cameras
- Suction device and gripper for removal of foreign materials and loose parts
- Individual tools adapted to the specific needs



Visual inspection of fuel alignment pins



Core mapping

Key figures

More than **360** successful applications for RPV and RPV internals inspection

Nearly **100%** usage rate during outages in German NPPs

References

Many customers request the availability of SUSI on site for the entire duration of their outage to ensure it is ready to use for ad-hoc tasks without delay.

Reactor types and designs:

- KWU BWR and PWR
- Framatome PWR
- Westinghouse PWR
- Babcock&Wilcox PWR
- VVER

NPPs in:

- Europe (Germany, Switzerland, France, Belgium, Netherlands, Sweden, Bulgaria, Slovenia)
- USA
- Brazil
- South Africa
- China

BWR: boiling water reactor PWR: pressurized water reactor VVER: water-water power reactor

Contact: outage@framatome.com
www.framatome.com

It is prohibited to reproduce the present publication in its entirety or partially in whatever form without prior written consent. Legal action may be taken against any infringer and/or any person breaching the aforementioned prohibitions.

Subject to change without notice, errors excepted. Illustrations may differ from the original. The statements and information contained in this publication are for advertising purposes only and do not constitute an offer of contract. They shall neither be construed as a guarantee of quality or durability, nor as warranties of merchantability or fitness for a particular purpose. All statements, even those pertaining to future events, are based on information available to us at the date of publication. Only the terms of individual contracts shall be authoritative for type, scope and characteristics of our products and services.

framatome