

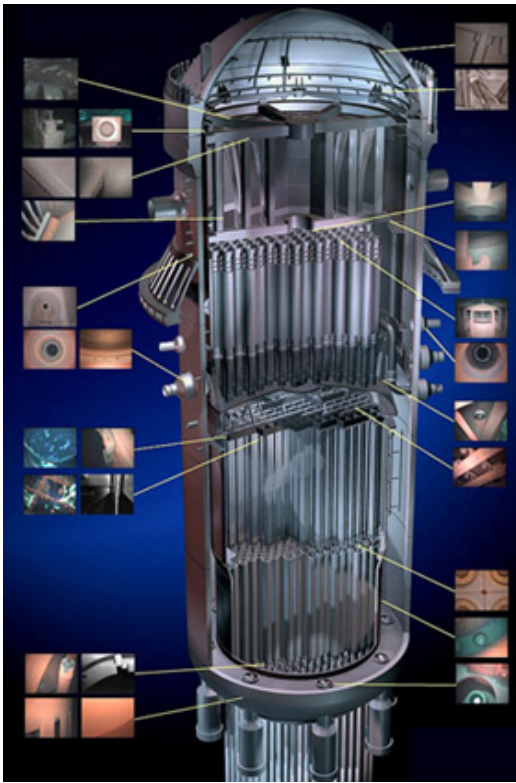
Nondestructive Examination Services

Enhanced Visual Inspection per VT-01

Introduction

WesDyne® has extensive experience with visual inspection/testing (VT) in nuclear power plants in both boiling water reactors (BWRs) and pressurized water reactors (PWRs). WesDyne continually performs many types of visual inspections in the reactor pressure vessel and internal components, typically using standard codes from various regulators around the world.

WesDyne used its extensive experience when developing and qualifying the generic enhanced visual inspection procedure, VT-01, for use at Swedish nuclear power plants.



Examples of VT inspection areas of ASEA BWR

Description

The VT-01 procedure encompasses detection, measurement and position information for surface breaking cracks. The procedure was developed during a five-year timeframe in close collaboration with the Swedish nuclear industry and power plants.

The VT-01 procedure allows for reliable detection of cracks with a width of 20 μm and a length of 5 mm.

WesDyne has a large number of qualified camera systems and tools for different inspection applications. Laser is commonly used for providing references to size and measure foreign objects and indications.

For the VT-01 inspection setup on-site, WesDyne has specially designed containers housing the equipment necessary to perform the inspections and also to process images and video feeds.

Camera handling and positioning can be performed either manually, using handling poles from the service-auxiliary bridge, or from mechanized platforms, depending on the requirements of the site.

Should a detected indication need classification (i.e., scratch or crack) and/or sizing, methods such as the molding VT (A-VT) technique can be applied.

Technical Data

Application platform	Manual or mechanized
Application environment	Dry or submerged
Operational water depth	1-30 m
Operational water temperature	10-40 C
Qualified detection width*	$\geq 20 \mu\text{m}^{**}$
Qualified detection length*	$\geq 5 \text{ mm}^{**}$
High-radiation area inspection	Yes, core inspections possible with radiation-resistant equipment

* Qualifying agency: Swedish Qualification Centre

** Smaller defects can be detected and sized using the WesDyne TRC A-VT technique.

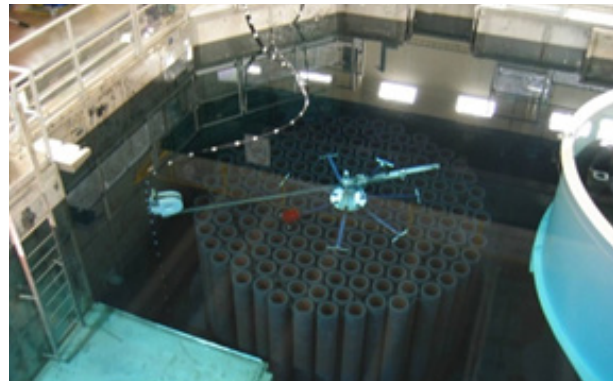
Benefits

The visual inspection techniques afford a flexible and reliable method for screening and detection of defects. The overall setup has a low footprint in the reactor, making it possible to perform multiple inspections of parallel activities.

The visual inspection technique is very operator dependent and the WesDyne operators have proven ability through process and experience to quickly and accurately distinguish between false calls and real defects and, as such, avoid unnecessary characterization efforts.

Experience

Westinghouse has performed enhanced visual inspections globally for many years including in the United States, Sweden, Finland, Japan, Belgium, France, Switzerland, Germany and Slovenia.



Mechanized enhanced visual inspection of BWR internals



Lasers are commonly used for sizing

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WesDyne is the nondestructive inspection branch of Westinghouse and a leading supplier of mechanized nondestructive examination (NDE) products for all inspection needs worldwide providing turnkey and one-off-type solutions with a focus on the nuclear market. WesDyne's expertise spans all aspects of remote and mechanized inspections, from problem analysis and solutions generation to development and manufacturing to field deployment of personnel and equipment. Inspection capabilities cover all key NDE areas such as ultrasonic, visual, eddy current, magnetic particle, dye penetrant and X-ray.

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