VX Exchanger XL

A product of

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VISION IN X
INDUSTRIAL IMAGING

Experience in Digital Industrial Radiology Since 1996
Application:
- Tube to tube-sheet weld inspection in heat exchangers, boilers, steam generators

Purpose of the inspection:
- Prevention of leakages and reduction of shutdown time
- Volumetric defects need to be found
Conventional approach: isotopes and film

- Time and labour intensive (→ only sampling possible)
- Needs storage and transportation of isotopes
- High costs (2-3 EUR per exposure)
- Delay between exposure and evaluation

Gammamat B3
1 x 0.5 mm Source
Activity ~110 GBq
Film C3, 10 x 12 cm,
Pb 0.02/0.02, pinched
Vision in X approach:

- Rod anode X-ray tube
  - Eliminates isotopes
  - Better image quality because of higher flux (dose-rate)

- Specialized DDA (with hole in the middle)
  - Eliminates film and its development
  - High sensitivity
  - Immediate result

- Advanced software
  - Controlling of hardware
  - Image evaluation (filtering, measuring, annotation)
  - Reporting and archival of results
Advantages

- No isotopes
  - Simple handling
  - Small (under 2 m) restricted area
  - Better defect sensitivity (down to 0.5 mm in steel)

- No film
  - Saving on consumables
  - Fast inspection
  - High defect sensitivity (down to 0.1 mm in steel)
Advantages (continued)

- Significant cost and time savings
  - 1500 joints per 8-h shift (working in a 2-men team)
  - Simultaneous production and testing (restricted area only 2 m)
- Immediate results availability
- Computer-aided analysis and reporting
The system fits in one box and can be flown anywhere with no problems

Fast and simple ready-to-use
VX Exchanger XL
Specialised mage processing allows improved defect visibility
Digital vs. Analogue Comparison
Digital vs. Analogue Comparison

85 GBq, 1 x 0.5, film C3, 2 x 0.02 Pb screen, \( t_B = 1 \text{ min} \)

130 kV, 0.5 mA, film C3, 1 mm Sn filter, 2 x 0.02 Pb, \( t_B = 0.5 \text{ min} \)

75 kV, 0.5 mA, \( t_B = 10 \text{ sec} \) high pass filter
Radiation protection

- Doserate behind the measurement head:
  - 70 kV / 0.5 mA - 0.4 µSv/h
  - 75 kV / 0.5 mA - 2 µSv/h
  - 80 kV / 0.5 mA - 5 µSv/h
  - 85 kV / 0.5 mA - 18 µSv/h
  - 90 kV / 0.5 mA - 60 µSv/h

- Restricted area: 2 x 2 m²
- Lower radiation exposure of inspection personnel
- No influence of production process at the manufacturing site
- ISee! Pro NDT software: manufacturer-neutral, flexible and modular (>50 add-ons), sophisticated inspections tools (ISO/ASME conformance)

- Several complete solutions (hardware-software systems) with focus on weld inspection: general flat and circumferential welds and heat exchanger testing

- Consulting and hardware solutions from one source

- Vision in X is listed as supplier by BASF North America, BASF SE (Europe), Dekra, Acuren, Technip, CEA, Areva.

- DGZfP uses ISee! Professional for educational purposes, many famous customers or cooperation partners