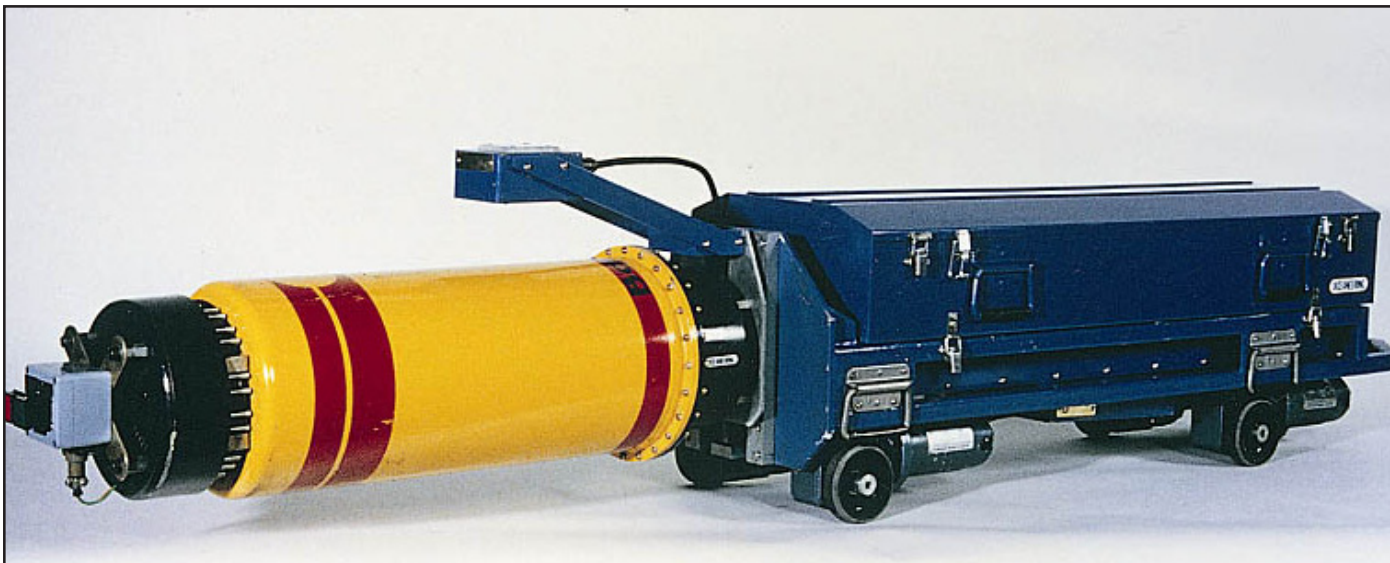


PIPELINE RADIOGRAPHY SERVICES



Oceaneering Asset Integrity operates a Pipeline Inspection Department providing a comprehensive range of services for both on and offshore pipe laying activities. At the forefront of pipeline NDT technology, the department provides radiographic and ultrasonic inspection capabilities (see separate Pipeline Automated Ultrasonics data sheet).

The department utilizes a pool of experienced personnel with industry recognized qualifications: ASNT, PCN, CSWIP, ERS and AWS. Operational bases are located in the United Kingdom, Middle East, Asia and the Americas.

The department provides a range of four-wheel drive pipeline crawlers capable of operating in pipes from 3in to 72in outside diameter utilizing high output constant potential X-ray heads or gamma radioisotopes. Gamma radiography is possible down to 3in OD pipes using 1mm spherical selenium-75 radioisotopes operated from specially designed tungsten exposure heads.



PIPELINE RADIOGRAPHY SERVICES

Radiographic Quality

Accurate control of X-ray tube output by the microprocessor gives consistent radiographic density over the operational duration of the battery. All X-ray tubes are 360 panoramic with true radial beam.

Crawler General Specification

| | |
|-------------------|--|
| Stopping accuracy | ± 6mm |
| Batteries | Sealed lead acid 48V and 120V |
| Battery charger | 10 channel |
| Control isotope | 10 milli Curie Caesium 137 |
| Motor protection | Fully automatic |
| Braking | Dynamic |
| X-ray tubes | 120, 160, 200 and 300 kV |
| Gamma head | 20 Curie and 100 Curie Iridium 192 40 Curie Selenium 75 |

The table below details the extensive range of crawler types, sizes and operating parameters that are available to radiograph all sizes of transmission pipelines both on and offshore.

| Model | 3 in Gamma Crawler | 5 in Gamma Crawler | 5 in X-ray Crawler | | | | 12-24 in X-ray Crawler | | | |
|--|--------------------|--------------------|--------------------|---------------|---------------|---------------|------------------------|---------------|---------------|---------------|
| | | | 6-8 | 8-12 | 10-12 | 12-16 | 12-18 | 16-24 | 24-36 | 36-72 |
| Typical Pipe size (in) | 3-6 | 6-12 | 6-8 | 8-12 | 10-12 | 12-16 | 12-18 | 16-24 | 24-36 | 36-72 |
| X-ray Tubes (kV) | N/A | N/A | 180 200 | 180 200 | 180 200 | 180 200 | 200 | 200 300 | 300 300 | |
| Total Weights (kg) less Batteries | 32 26 | 41 32 | 37 22 | 42 22 | 51 22 | 68 22 | 130 76 | 125 80 | 170 85 | 238 88 |
| Overall length (m) | 2.5 | 2.5 | 2.8 | 2.8 | 2.8 | 2.8 | 3.3 | 2.1 | 2.1 | 2.1 |
| Battery Capacity | 24V 3.6 Ah | 48V 3 Ah | 48V 7 Ah | 48V 10 Ah | 120V 10 Ah | 120V 10 Ah | 120V 10 Ah | 120V 10 Ah | 120V 25 Ah | 120V 50 Ah |
| Min Pipe Int. Dia (mm) | 73 | 120 | 146 | 155 | 229 | 248 | 270 | 400 | 500 | 800 |
| Typical exposure per battery charge | 90x10 sec | 90x20 sec | 60x20 sec | 100x20 sec | 70x30 sec | 70x30 sec | 120x20 sec | 70x30 sec | 70x30 sec | 70x120 sec |
| Max Incline (°) (depends on pipe coating) | 7.5 | 25 | 25 | 25 | 30 | 30 | 30 | 30 | 30 | 30 |

Information above is typical and varies with X-ray tube, battery size, etc.

