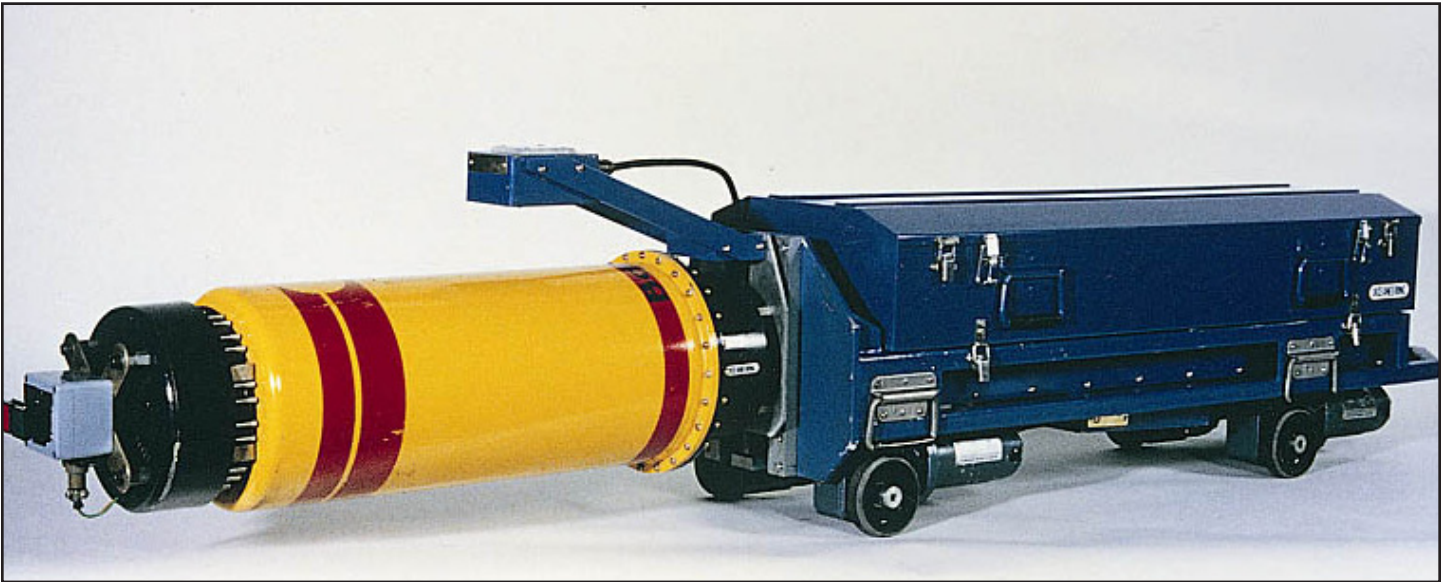


PIPELINE RADIOGRAPHY SERVICES



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			
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.

