

Trip Avoidance X-Ray Inspection (TAXI™) System

Enabling in-service, radiographic inspection near nucleonics

Our innovative TAXI™ solution solves the age-old production problem of performing radiography inspections on installations where nucleonic level instrumentation is used to control process product levels. The TAXI™ system enables operators to complete radiography on safety-critical pressure piping without having to defer work scopes and avoids unplanned process shutdowns known as “trips”.

This increased flexibility maximizes uptime and facilitates the assessment of corrosion, pitting, and identification of remaining wall thickness and other defects on small outer diameter (OD) pipework.



FEATURES

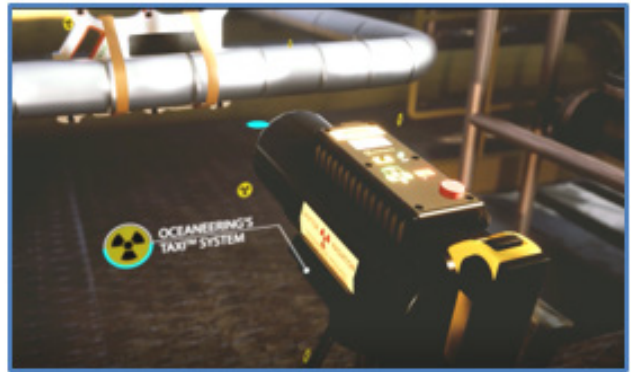
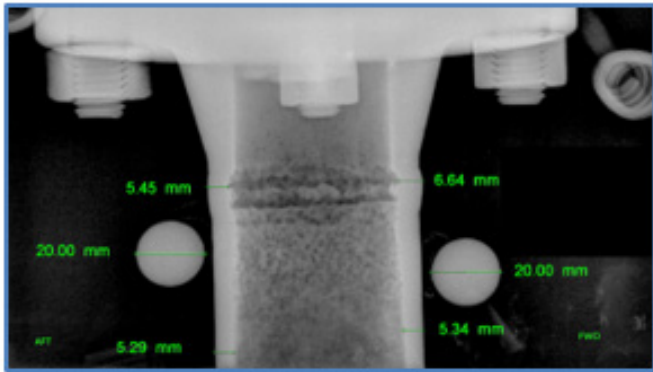
Meets IRR17 requirements, including unique radiation warning system

High quality digital x-ray images for tangential or contact exposures

Rope access deployable system is light and easy to setup

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The TAXI™ system complies fully with IRR 2017 legislation and enables users to remain in safe control of production during radiography operation, avoiding control room-imposed plant inhibits which reduce the risk of loss of primary containment. The TAXI™ system can be used across industries and its principle application is for detecting CUI on large and small diameter pipework in addition to measuring remaining wall thickness on most small diameter pipework.

Model	Weight (lb / kg)	kV	Steel Penetration (in / cm)	Dose mR Per Pulse*	Pulse Width	Pulse Rate Per Second	Rear Standoff Distance (ft / m)
XR150	4.5 / 2.04	150	1/2 / 1.27	2.7-5	50 ns	4 cts**	10 / 3
XR200	12 / 5.44	150	1/2 / 1.27	2.7-4	50 ns	25	10 / 3
XRS ₃	13 / 5.9	270	1 / 2.54	2.7-4	25 ns	15	10 / 3
XRS ₄	20 / 9.07	370	1 3/4 / 4.46	4.5-7	10 ns	10	20 / 6

*mR per pulse at 12 in / 30.48 cm

** 3 Pulses Per Count

The system consists of a range of Golden Engineering XRS cameras, all battery-powered pulsed X-ray generators, a high-specification Manfrotto™ tripod, collimating cap, specialized x-ray monitor, and a unique Oceaneering radiation warning system. The popular XRS3 weighs just over 13 pounds, yet is capable of penetrating at least an inch of steel with an x-ray digital image plate. Digital detector arrays (DDAs) are more suited to the very short exposure times (typically eight seconds per 100 pulses); however, phosphor based imaging plates can be used which allow longer exposure times, where required.

When considering radiation safety, the TAXI™ system is not classed as “dangerous goods” as it contains no radioactive material. This enables it to be rapidly deployed by air with portable digital detectors, where necessary, to address process emergencies.

Golden Engineering, Inc. Portable X-Ray Systems Technical Data

Model	XR200	XRS ₃	XRS ₄
Dimensions, including battery pack (L x W x H x W)	11.95 in x 4.26 in x 5.83 in x 11 lb / 30.35 cm x 10.82 cm x 14.81 cm x 5 kg	14.20 in x 4.26 in x 7.44 in x 11.8 lb / 36.07 cm x 10.82 cm x 18.9 cm x 5.4 kg	19.26 in x 4.8 in x 7.05 in x 18.3 lb / 48.92 cm x 12.19 cm x 17.91 cm x 8.3 kg

X-Ray Output			
X-ray dose per pulse (12 inches in front of unit)	2 mR to 3.4 mR	2 mR to 4.3 mR	4 mR to 8.5 mR
Pulses per battery charge	6,000	4,000	3,000
Pulses per second (nominal)	10	15	9
Expected tube life (glass tube)	100,000 pulses	100,000 pulses	50,000 pulses
X-ray source size	1/8 in / 3 mm	1/8 in / 3 mm	1/8 in / 3 mm
Maximum photon energy	150 kVp	270 kVp	370 kVp
X-ray pulse width	50 ns	25 ns	10 ns

Electrical and Thermal Characteristics			
Battery voltage	18 to 20 V	18 to 20 V	18 to 20 V
Battery type	Lithium-ion	Lithium-ion	Lithium-ion
Battery recharge time	1 h	1 h	1h
Current draw	9A @ 18 to 20 V	20A @ 18 to 20 V	13A @ 18 V
Average X-ray tube current	0.5 mA	0.25 mA	0.25 mA
Storage temperature	0° to 120°F / -18 to 50°C	0° to 120°F / -18 to 50°C	0° to 120°F / -18 to 50°C
Operating temperature	0° to 120°F / -18 to 50°C	0° to 120°F / -18 to 50°C	0° to 120°F / -18 to 50°C
Maximum duty cycle	200 pulses every 4 min / 3,000 pulses per h	200 pulses every 4 min / 3,000 pulses per h	200 pulses every 4 min / 3,000 pulses per h
High temperature or high use duty cycle	Rest 30 s every 50 pulses and 4 min every 200 pulses	Rest 30 s every 50 pulses and 4 min every 200 pulses	Rest 30 s every 50 pulses and 4 min every 200 pulses
Warm-up	None required	None required	None required



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