

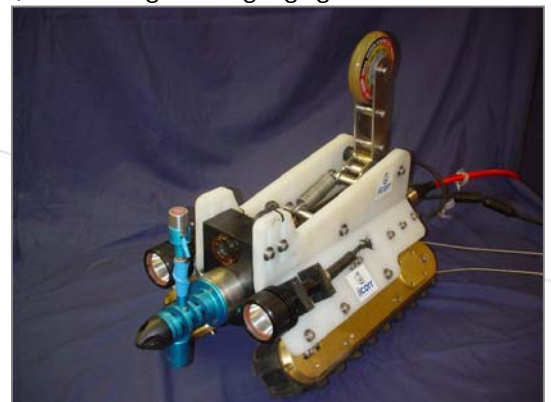


iicorr Ltd has recently designed the Trac-scan crawler system resulting in a £700,000 saving for its client. Donald Ballantyne, Division Manager for iicorr inspection and corrosion services, discusses the project and why the need for the innovative system arose

The Problem

The Trac-scan Crawler System was designed for a specific clients' requirement to inspect a horizontal 14" section of water injection pipeline that had failed while in service. Historically the failure mode was that of localised corrosion. Due to the likely hole in the subsea pipeline, the line could not be pressurised and this meant traditional autonomous and tethered pig systems could not be used. The inspection task related to gathering wall thickness data and video footage from the vertical riser and horizontal pipeline – in this case, 140m vertical drop subsea, a step out of 110m, including changing geometries and elevations.

The crawler system was created to inspect the out-of-reach section with the use of an ultrasonic NDT technique. The intention was to confirm that the failure mode was attributed to a localised anomaly and not general corrosion. By proving the majority of the system was in good condition and not in need of replacement, it meant a saving of approximately £700,000 in materials and subsea intervention costs.



Crawler System

The system incorporates a video camera with the option of both real time footage and digital-still capturing. It also encompasses a submersible probe incorporated into heli-scanner wall mapping tool - this allows for 100% ultrasonic measurements to be taken over a given area. Also, novel to this tool was the integrated high pressure jetting attachment that allowed the pipe to be jetted with high-pressure water, removing sand and debris in the pipeline that would have otherwise meant the pipeline would have been un-passable. The crawler can traverse vertical and horizontal sections of pipe by sprung loaded wheels or tracks positioned at 120 degrees to apply positive traction to the internal walls.



Small Bore Crawler System

The technology available did not readily lend itself to the underwater element of the project and a bespoke system that would interface iicorr's inspection technology. A number of technical problems had to be overcome if the project was to a success, these included;

- Depth of the water, no crawler rated to this depth was readily available for a 14" spool. Tool needed to be rated to at least 18 Bar.
- The subsea riser section had a number of 3D bends at various axes to the horizontal which had to be negotiated.
- Very limited UT carrying capability, which meant the development of a new scanning method which involved moving a probe over two axes with motor.
- Extended reach High Pressure Jetting capability that would allow the preparation of the internal surface of the riser section. This would allow best possible ultrasonic thickness readings to be taken.
- Project had to be completed in a five-week lead-time to allow operations to take place.

The Trac-scan vital statistics

Scan speed	UT scan 2m/ hr.
Top Speed	9m/min
Depth rating	18 bar tested or 180m
Range	500m standard umbilical although up to 1000m is available
Min pipe diameter	6" Current design
Max pipe diameter	20" Current design
Max Pull strength	85kg
Lighting	2 x 50W or 2x 75 W
HP Jetting	up to 10K PSI



Roddy James, Business Development Director, iicorr, with the Crawler System.

Flexibility and Cost-saving

The equipment had to be designed, manufactured and ready to be shipped offshore for work in a 5-week time frame. The clients' necessity to have results from the inspection were increased due to operational requirements – the line being out of service meant a loss of 4,000 barrels of production per day. It is estimated that this type of project would normally be carried out over an 8-10 week period.

The inspection was carried out by iicorr timely and efficiently and provided the client with a powerful decision making capability. This ultimately resulted in a positive result for all parties and significant cost saving for the client. This type of project highlights iicorr's capability of being able to carry out a quick development of an innovative new solution to a demanding requirement in a tight time frame.

iicorr was able to design, manufacture and procure this unique solution for around the same cost as the mobilisation fee for most of our competitors tethered management and intelligent pig systems. This field proven system is now available for various inspection requirements for spool pieces ranging from 6-20" in diameter. The Trac-scan is a modular system and can easily be adapted to suit a variety of inspection tasks and is also available for other deployment tasks. The main advantages of this system over other existing systems are:

- No need for expressive pig launching capabilities.
- Only access to one end of the pipeline system required, ideal for tiebacks etc.
- Greater distance accuracy.
- Can operate around 3D Bends (20 inch tool).

iicorr has now taken this technology forward and has designed and manufactured a Crawler which has been specifically developed for the smaller bore sections. This new small bore is suitable for 6" – 8" pipework.



New small bore (6-8inch) crawler system.



New small bore (6-8inch) crawler system, power drive package.

About iicorr Ltd

iicorr integrity, corrosion and inspection management activities spring naturally from our scientific background in corrosion engineering and risk management, combined with practical experience in RBI and pressure systems examination activities worldwide. Risk Based Inspection (RBI) is a method of determining the consequence and likelihood of failure to produce a criticality rating to determine the overall risk or criticality rating. By determining the overall risk or a particular component, an appropriate inspection plan can be ascertained. As well as qualitative and quantitative RBI, we carry out the whole corrosion, integrity and inspection management process on the following types of equipment: process & utility pipework and vessels, Subsea pipework, Pipelines, PSV's, Risers, Structures, Downhole, Harbours

Corrosion engineering is a major part of our business and we carry out Corrosion, Integrity and Inspection Management, detailed metallurgical and design reviews from conceptual design stages, front end engineering and design (FEED) projects and reviews of current operating installations, design of corrosion protection schemes, written scheme of examination development, examinations and inspections of process plant and pipelines, Corrosion Management Strategies, operational support and failure investigations.

iicorr Ltd has an extensive and independently certified management system that conforms to the standards of ISO 9000:2000 (Quality Management), ISO14001:2004 (Environmental Management).