

PIPELINE INTEGRITY MANAGEMENT SYSTEM (PIMS)

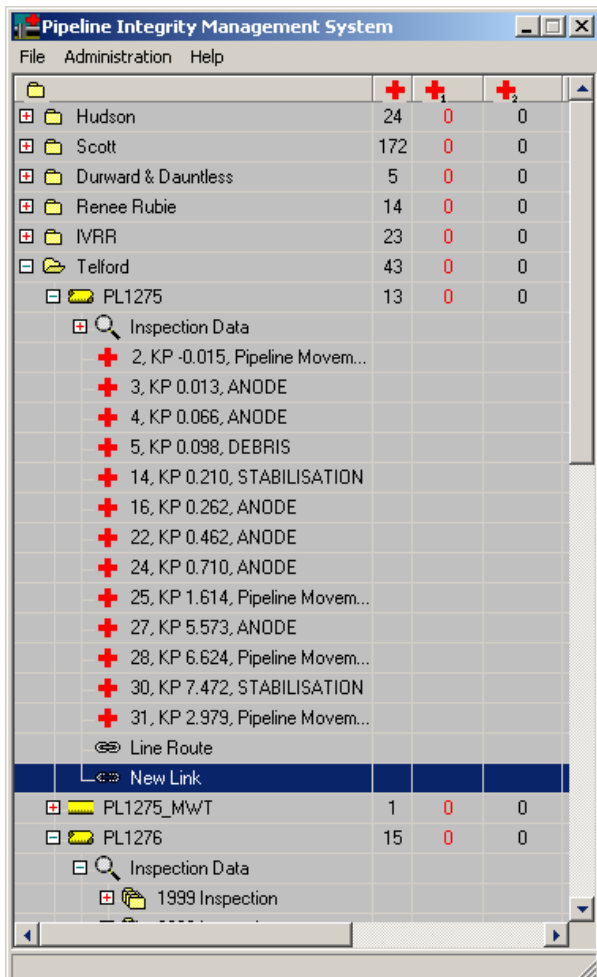
PIMS is a database system for managing subsea pipeline anomalies and inspection data with Integrity Management input, analysis and corrective action control.

Subsea Asset managers do not have the time to filter through the mass of pipeline inspection data and reports to see where the anomalies are and the Integrity Manager doesn't have time to continuously report to the Asset Manager on what is planned for the resolution of any anomalies. Equally, the Integrity Manager has to find more efficient ways of ensuring the operation of a pipeline. This can be achieved by optimizing inspection campaigns, implementing consistency in reporting and anomaly criteria and maintaining an Anomaly Tracking System that provides links to all the relevant current and historical inspection data and integrity input.

Pisys have been developing subsea pipeline inspection and reporting software for more than fifteen years. We have combined this industry knowledge and user understanding, transferred some of the best technology from our existing products, and used all the modern open system technologies to produce a modern, efficient and flexible integrated system that can be packaged and scaled to meet the needs of all subsea asset and integrity managers.

PIMS can be used across an organisation network and can be supplied for both Oracle and SQL database platforms or using flat-files.

Here is a brief functionality overview:-



| Asset/Line | Count | + | + | + |
|---------------------------------|-------|---|---|---|
| Hudson | 24 | 0 | 0 | 0 |
| Scott | 172 | 0 | 0 | 0 |
| Durward & Dauntless | 5 | 0 | 0 | 0 |
| Renee Rubie | 14 | 0 | 0 | 0 |
| IVRR | 23 | 0 | 0 | 0 |
| Telford | 43 | 0 | 0 | 0 |
| PL1275 | 13 | 0 | 0 | 0 |
| Inspection Data | | | | |
| 2, KP -0.015, Pipeline Movem... | | | | |
| 3, KP 0.013, ANODE | | | | |
| 4, KP 0.066, ANODE | | | | |
| 5, KP 0.098, DEBRIS | | | | |
| 14, KP 0.210, STABILISATION | | | | |
| 16, KP 0.262, ANODE | | | | |
| 22, KP 0.462, ANODE | | | | |
| 24, KP 0.710, ANODE | | | | |
| 25, KP 1.614, Pipeline Movem... | | | | |
| 27, KP 5.573, ANODE | | | | |
| 28, KP 6.624, Pipeline Movem... | | | | |
| 30, KP 7.472, STABILISATION | | | | |
| 31, KP 2.979, Pipeline Movem... | | | | |
| Line Route | | | | |
| New Link | | | | |
| PL1275_MWT | 1 | 0 | 0 | 0 |
| PL1276 | 15 | 0 | 0 | 0 |
| Inspection Data | | | | |
| 1999 Inspection | | | | |

Tree View Panel with 'Asset' at top level

The database is structured from Asset Level down through Line to Anomalies and Inspection Data.

- Relevant info at high level – then 'drill-down' for those users most interested.
- Add and report on; Assets, Lines, Inspections, Anomalies and Links
- Asset Manager sees overviews – Integrity Manager sees all details and inspection data
- User defined column options – Anomaly Count, Responsibility, Action Date...
- Links to other documents, files, programs, etc can be added at any level – eg Field Layout drawing, Pipeline Specifications document, Asset web-site, Inspection Report document, Anomaly photographs, Powerpoint files.....

Assets, lines, anomalies, links and surveys can be added at any time. At each level properties can be added that are used in summary reports.

Line Details

DTI No.:

Type:

Field:

Routing:

Length: Date Laid: (YYYY)

Start At:

KP: Easting: Northing:

End At:

KP: Easting: Northing:

Contents:

PiggyBack: Allowable Span Length:

Outside Diameter: Wall Thickness:

Material Specification:

Coating:

Trench Details:

Asset Details

Name:

Description:

Link Details

Label:

Volume:

File Drive:

File Path:

Anomaly Details

PL1286 / 2

KP: Easting:

Northing: DCC:

Water Depth: Depth of Burial:

Gyro:

Date/Time: VCR Lapsed Time:

Event Type:

Event Subtype:

Location:

Distance From Pipe: Length:

Width: Height:

Start Clock Position: Stop Clock Position:

Stab CP: Continuous CP:

Video Tape No.:

Field Joint:

Comments:

Survey Details

Title:

Contractor:

Survey Type:

Vessel:

ROV:

Date Ref:

Data is imported using generic routines. It is possible to import data in many different formats. Data Types include:-

- ✓ Line Properties
- ✓ Existing Anomalies
- ✓ KP Databases
- ✓ Inspection Events Navigation, Transverse Profiles, CP

Import CP Data

Name:

File:

KP:

Import Event Data

Name:

File:

KP:

Only Import Anomaly Events Find Anomaly Numbers KP Tolerance:

Import Filter Options

Date:

Event Type:

Location:

KP:

Start Clock Pos.:

Stop Clock Pos.:

Dist. From Pipe:

Stab CP:

Length:

Continuous CP:

Width:

Video Tape No.:

Height:

Field Joint No.:

Pipeline Integrity Management System (User: Administrator, Access: Administration)

File Edit View Tree Administration Help

Durward & Dauntless

Asset

Line

P/S Data

Anomaly

Survey

Line Summary + Anomaly Summary

Sort By: Ascending DTI No. Secondary Sort By: Ascending -- None --

| DTI No. | Line Type | Field |
|------------|----------------------------|-----------|
| PL1285 | Rigid Pipeline | Durward |
| PL1286 | Rigid Pipeline | Durward |
| PL1287 | Rigid Pipeline | Durward |
| PL1288 | Rigid Pipeline | Durward |
| PL1289 | Chemical/Control Umbilical | Durward |
| PL1300 | Rigid Pipeline | DC2 |
| PL1304 | Rigid Pipeline | Dauntless |
| PL1305 | Rigid Pipeline | Dauntless |
| PL1306 | Rigid Pipeline | Dauntless |
| PL1307 | Chemical/Control Umbilical | Dauntless |
| Trawl Snag | Rigid Pipeline | Dauntless |
| UMB3 | Chemical/Control Umbilical | Dauntless |

Information

Asset: Hudson Line: 20 Anomaly: 24

Line Summary + Anomaly Summary

Goto Report

Sort By: Ascending Line ID Secondary Sort By: Ascending -- None --

| Line ID | Anom No | KP | Type | Category | Action | Responsibility |
|-----------|---------|--------|----------|----------|---------|-------------------|
| FSM CABLE | 1 | 0.000 | SURVEY | 7 | Assess | Integrity Manager |
| PL1018A | 2 | 9.903 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1018A | 5 | 10.205 | DEBRIS | 4 | Rectify | Asset Engineer |
| PL1019A | 1 | -0.092 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1019A | 3 | -0.017 | FEATURE | 5 | Assess | Asset Engineer |
| PL1021A | 5 | 0.054 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1021A | 7 | 5.744 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1021A | 8 | 7.003 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1021A | 9 | 7.145 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1021A | 10 | 7.178 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1021A | 11 | 7.272 | FREESPAN | 5 | Assess | Integrity Manager |
| PL1021A | 12 | 7.516 | FREESPAN | 5 | Assess | Integrity Manager |

Pipeline Integrity Management System

File Administration Help

| | + | + | + | Type | Responsibility |
|---------------------------|----|---|---|--------|-------------------|
| Hudson | 24 | 0 | 0 | | |
| PL1018A | 2 | 0 | 0 | | |
| PL1019A | 2 | 0 | 0 | | |
| PL1020A | 0 | 0 | 0 | | |
| Inspection Data | | | | | |
| 1999 Inspection | | | | | |
| PI1020_a | | | | | |
| 2000 Inspection | | | | | |
| PL1021A | 11 | 0 | 0 | | |
| PL1022 | 2 | 0 | 0 | | |
| PL1022.1 | 1 | 0 | 0 | | |
| PL1023 | 1 | 0 | 0 | | |
| Inspection Data | | | | | |
| 1999 Inspection | | | | | |
| 1, KP 5.653, DEBRIS | | | | DEBRIS | Integrity Manager |
| PL1024 | 0 | 0 | 0 | | |
| Inspection Data | | | | | |
| PL1024A | 2 | 0 | 0 | | |
| PL1025A | | | | | |
| Inspection Data | | | | | |
| 1, KP 0.531, INTERVENTION | | | | | |
| FSM CABLE | | | | | |
| PL1022.2 | | | | | |
| PL1025 | | | | | |
| PL1023.26 | | | | | |
| PL1023.27 | | | | | |
| PL1018 | | | | | |

Configurable displays to bring all the key data to the summary views for review and printout.

Pipeline Integrity Management System (User: Administrator, Access: Administration)

File Edit View Tree Administration Help

Durward & Dauntless / PL1286

Asset

Line

P/S Data

Anomaly

Survey

Anomaly Summary

Sort By: Ascending KP Secondary Sort By: Ascending -- None --

| Date/Time | KP | Length | Width | Height | VCR Lapsed Time | Ext |
|------------|-------|--------|-------|--------|-----------------|-----|
| 21/07/2000 | 0.205 | 1 | 0.05 | 0.05 | | |
| 21/07/2000 | 4.116 | 1.5 | 0.05 | 0.05 | | |
| 21/07/2000 | 4.205 | 1 | 1 | 0.5 | | |

ANOMALY TRACKING

The Integrity Manager, using inspection data and other information, creates the anomalies. In addition to the properties of the anomaly, the user can also specify a Significance, Actions, Responsibilities and schedules.

The data import routines attempt to match incoming data to existing anomalies so the user can see the inspection history.

Anomaly Details PL1286 / 2

KP: Easting:

Northing: DCC:

Water Depth: Depth of Burial:

Gyro:

Date/Time: VCR Lapsed Time:

Event Type:

Event Subtype:

Location:

Distance From Pipe: Length:

Width: Height:

Start Clock Position: Stop Clock Position:

Slab CP: Continuous CP:

Video Tape No.:

Field Joint:

Pipeline Integrity Management System (User: Administrator, Access: Administration)

File Edit View Tree Administration Help

Durward & Dauntless / PL1286 / 2, KP 4.116

- 24 Durward & Dauntless
- 0 PL1285
- 3 PL1286
 - 1234 5678 P5 Data
 - 1234 5678 Inspection Data
 - 1, KP 0.205
 - 2, KP 4.116
 - 3, KP 4.205
- 0 PL1287
- 3 PL1288
- 6 PL1289
- 7 PL1300
- 1 PL1304
- 0 PL1305
- 1 PL1306
- 0 PL1307
- 1 Trawl Snag
- 2 UMB3
- 6 Fife, Flora and Fergus
- 61 Hudson
- 71 I/RR
- 35 Renee Rubie
- 422 Scott
- 107 Telford
- 2 Triton

Details

| KP | Easting | Northing | DCC | Water Depth | Depth Of Burial | Gyro | Date/T |
|-------|---------|----------|-----|-------------|-----------------|------|--------|
| 4.116 | | | | | | | 21/07/ |

Category:

Integrity Management

IM: Date:

Action: Responsibility:

By Date:

Comment:

Inspection History

| Date/Time | Survey Name | KP | Length | Height | Width | Location |
|---------------------|-------------|-------|--------|--------|-------|--------------------|
| 29/09/1999 04:13:23 | PI1286 | 4.116 | 1.5 | | 0.05 | On Pipetrack (pipe |

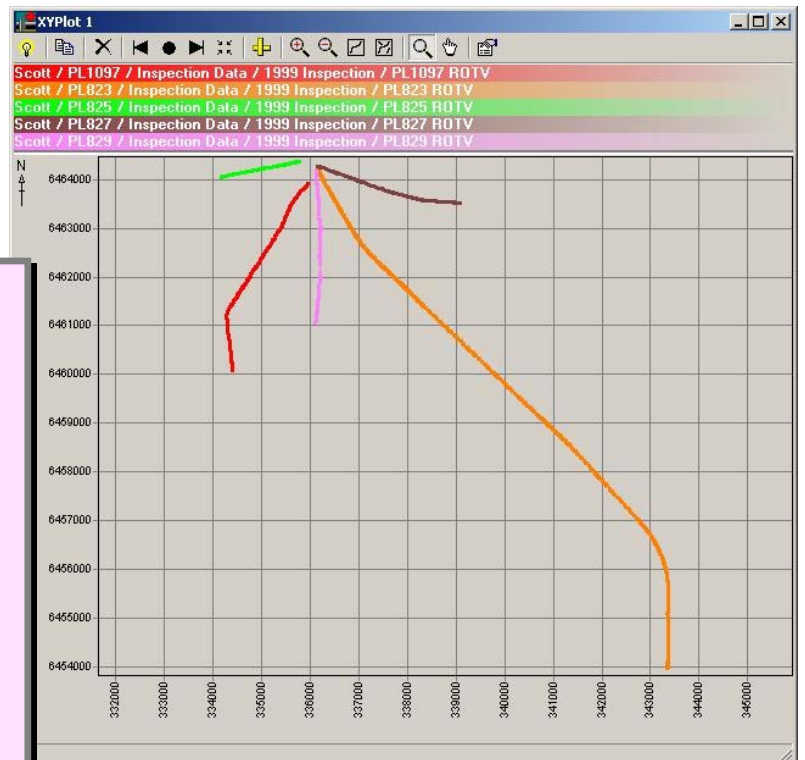
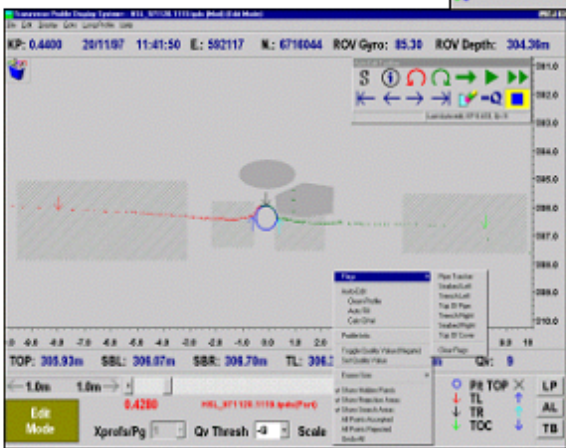
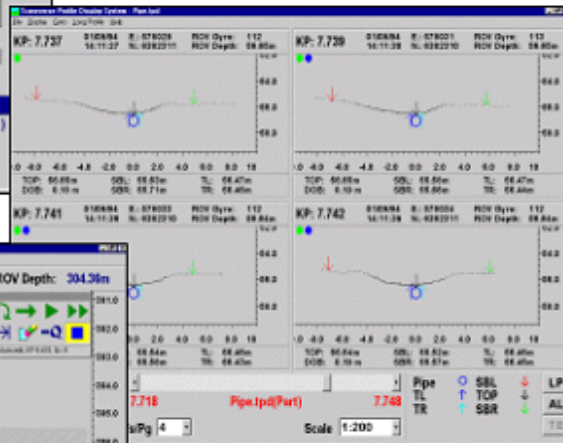
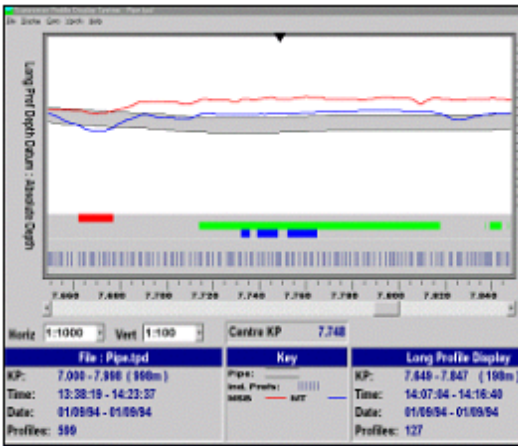
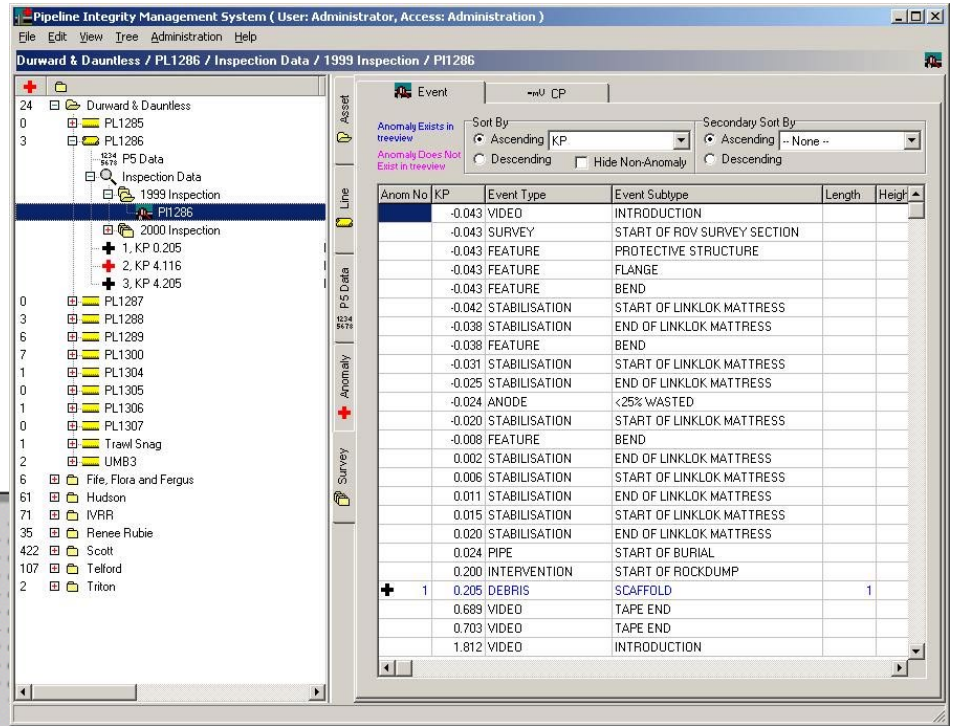
IM Change History

| Date | Field | From | To |
|------------|----------------|-----------------------------|--------------------------------------|
| 09/04/2001 | Responsibility | | Asset Engineer |
| 09/04/2001 | Action | | Rectify |
| 09/04/2001 | Category | 9 | 4 |
| 09/04/2001 | Comment | Comment Change. | Comment Change. |
| 09/04/2001 | Description | Scaffold, on pipeline route | Remove d Scaffold, on pipeline route |

As the integrity management properties are changed, the IM Change History section is updated. Thereby maintaining an audit trail.

INSPECTION DATA REVIEW

Events, KP databases, Navigation and Profiles can be displayed in a number of combinations on simple graphic displays and included in generic reports.



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