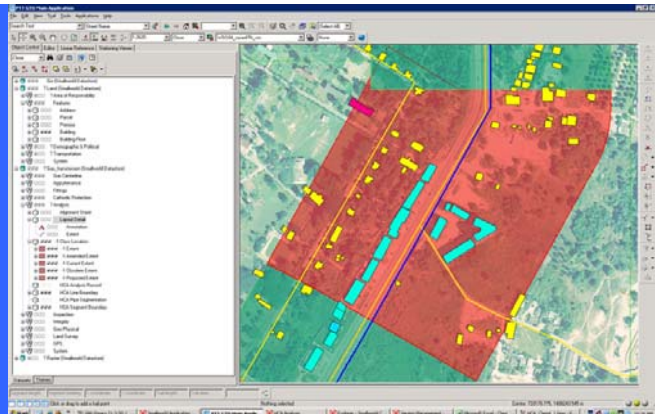


INNOVATION GIS ENHANCE ASSET RISK AND INTEGRITY MANAGEMENT.



CUSTOMER

Thai gas transportation has grown from simple supply systems to complex, so it is necessary to manage the network in safe and reliable. Integrity management plan has adopted to manage risk of pipeline compliance to ANSI B31.8S.

The methodology involves assessing and weighting the effectiveness of nine key integrity activities:

- Integrity plan
- Risk Assessment
- Defect assessment
- Repair method
- Spill detection
- Corrosion prevention
- In-line inspection
- Third party damage prevention
- Failure history

Establish and maintain a Pipeline Integrity Management System to insure mechanical integrity of the pipeline infrastructure to demonstrate that requirements to Thai legislation and regulation are satisfied.

The following activities are carried out:

- Draw up an inventory of threats to the mechanical integrity of the pipeline
- Draw up an inventory of the control measures
- Monitor the effectiveness of the control measures
- Measurement of the actual situation
- Repair the mechanical integrity where necessary
- Record the data concerning mechanical integrity in the Pipeline Integrity Management System
- Establish research programs and studies to support condition monitoring and condition assessment to maintain the mechanical integrity of the pipeline

SOLUTION

GIS Application for the pipeline integrity management system created during the project, and uses three main components. A GIS based database ESRI, GIS pipeline application management (Smallworld GTO) and application integrity analysis system (Slider 4 PIMS). The key GIS Smallworld GTO is used to input, store and manage the large amounts of pipeline data accumulated. While Slider 4 PIMS is used to analyze, the conditions of the pipelines. Threat and Mitigation Expert provides the highest level analysis assigning risks and mitigations to pipe segments and pipelines to meet ANSI B31.8S.

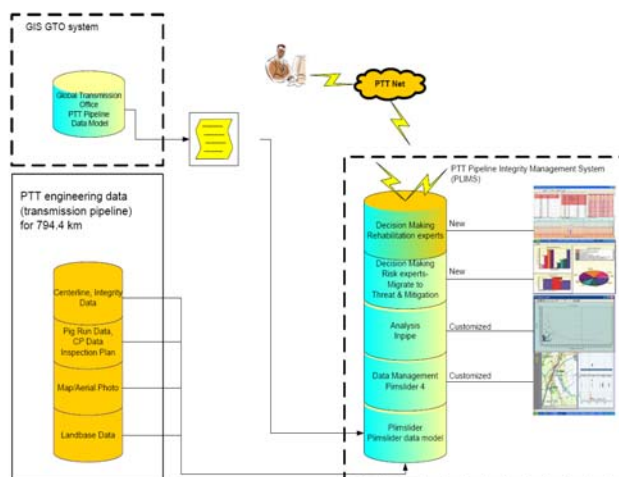


Figure GIS integrity Model



APPLICATION

Pipeline Integrity Management (PiMS) Application is PiMSlider module , In-pipe module and Risk expert module required in order to maintain the risk and integrity control within gas transmission line.

PiMSlider

The PiMSlider can be seen as the heart of the system and is used for storage of all pipeline related data concerning the position of the pipeline, equipment, crossing, operational data, ILLI data, maps, photographs, population density along the pipeline etc. it is mainly used for information retrieval. The operator can track the relationship between various figures and schedule action accordingly (survey, repair, maintenance etc.)

In-pipe

The In-pipe module enables the analysis of any kind of pipeline defect and other features based on the data provided by ILLI tools. This involves the linking of the features to map coordinates and an accurate positioning of the in-line data along a 3-dimensional model of the pipeline. For the city gas pipeline is not ready to pig run and do not have the ILLI data in the system from PTT.

Risk Expert

The ranking tool for operational pipelines enables the operator to carry out a relative risk assessment of the pipeline. It is tool for prioritization of maintenance and inspection programs. This data-based method used a model that identifies and quantifies the major threats and consequences of pipeline objects and the pipeline environment. The likelihood of all threats is quantified through the use of operational experience, opinions of subject-matter expert or on industry experience. The calculations are performed for all pipeline sections.

PROJECT

Subsea pipeline length 410 kilometers from gulf of Thailand and onshore underground pipeline 52 kilometers implemented uses GIS application to Integrity Management.

PiMS

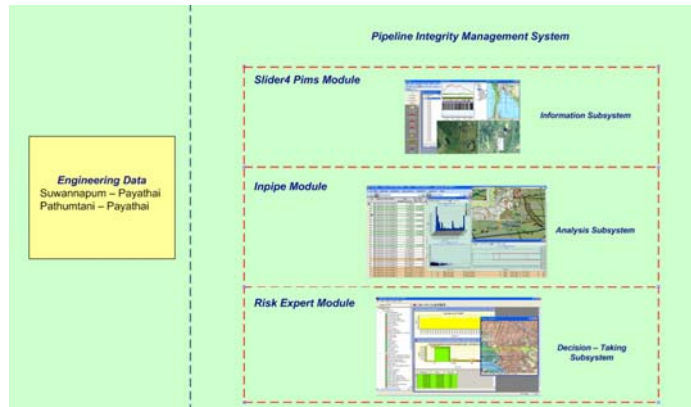


Figure PiMS Diagram

The system Applications are a set of program modules, which (by interacting between each other and by using the data from the Data Warehouse) enable the user to perform calculations of certain parameters of pipeline status, which can be interpreted as evaluation of certain aspects of the pipeline grid integrity.

The analytical subsystem represents an expandable set of applications, which is unified by a common database, common methods for information access and presentation. It provides for various calculations (strength, hydraulic, statistical), simulation of complex processes

The results of analytical subsystem operation (along with the source data) are the basis for the work of a **decision-taking subsystem**. This subsystem is designed for calculation of various operational risks (relative and probabilistic), as well as for selection of optimal strategy in pipeline repairs execution.

Pipeline material is steel coated with protection corroded material compliance to pipeline design criteria ANSI B31.8.

Products:
GE Smallworld GIS
ESRI
PIMSLIDER
DELL
Cisco

Communication:
Multiplexer
LAN
WAN

Applications:
Geospatial data
High consequence analysis
Inline Inspection analysis
Risk analysis
Rehabilitation

