The Oil and Gas industry worldwide is today undergoing its most dramatic shifts.

Price volatility and geopolitical uncertainties—technological advances, mergers and acquisitions, as well as new reporting and regulatory changes are redefining how the industry will move beyond tomorrow into the next decade of the 21st century.

Central to this evolution is global competition for fast-depleting natural resources, and the emphasis on sustainability, which are fundamental to the communities in which we work.

We are working with you to build a business that is safe, profitable and sustainable.

Though it is not possible to predict the future, it is possible to make practical decisions on controlling quality and cost, with a partner like VELOSI.

While some of the challenges are new at VELOSI, our mission has always been about “ENGINEERING FOR A SAFER WORLD.”

We offer a full range of specialist engineering consultancy services complete with our own in-house proprietary software that has been developed and tailored to the energy business.

As a service provider, we are always proactive and listen to the voice of our customers to fully understand their needs.

Within Velosi Asset Integrity Limited (VAIL), our greatest asset is our people who are qualified in all engineering disciplines, multi-tasking, highly motivated and wanting to serve our Clients always.

The Velosi Asset Integrity Limited (VAIL) business is focused on supporting our customers wherever they are working in managing the integrity of their operational assets to maximize efficiency, reliability, and costs. New projects offer us fresh challenges, while existing plants are becoming more aged and in need of more effective maintenance with the view to fit for purpose and life extension.

We look forward to working with you!
About Velosi

Velosi is a leading global consulting firm that provides **Asset Integrity Management, HSE, Engineering Services and Software Solutions** to clients in the energy industry around the world.

Velosi has developed a comprehensive Asset Integrity Management software; VAIL-Plant, that can be tailored to fulfill the specific needs of Energy companies worldwide.

By combining global coverage and local knowledge with our wide range of services we are able to create tailored solutions to complex problems. Our range of inter-related services and modular methodology ensures that we can accommodate a wide range of projects.

Company Experience and Capabilities

Velosi team has more than 35 years of experience helping clients by providing a one-stop center for complete Asset Integrity Management, HSE, Engineering Services and Software Solutions. We operate through associated offices in Middle East, Africa and Asia.

The strength of our approach comes from offering a multiregional service while meeting local needs. Velosi achieves this because we operate in selected world’s major established and emerging markets.

From your local offices, you will be able to easily access our network to receive the service that you need. This approach provides a solution to companies who are trying to control operations in unfamiliar territories remotely. With local staff and local knowledge, we are uniquely positioned to support companies that need to control operations remotely or in unfamiliar territories.

By cutting through barriers, we provide companies with the highest levels of commitment and personalized services.
Partnering with the World’s Top Companies

Since 2007, we have been part of more than 250 major projects awarded by some of the world’s leading multinational companies in the energy sector. We are working with the world’s largest energy companies including ADNOC, Dragon Oil, Saudi Aramco, LUKOIL, QAFCO, PETRONAS, TANAP, Sonatrach, PPL, SNGPL, Dolphin Energy, KPOC, OOCEP, QP, KOC, ORPIC, REPSOL, BP and others, who contracted Velosi services as a one stop center for Asset Integrity Management, HSE, Engineering and Software Solutions.

Building Long Term Client Relations

Our very successful retention of existing clients speaks for itself. It is a testimonial of the reputation and confidence our clients have in our team and our services. Demand driven by new projects and concerns over safety and the environment makes the services VELOSI provides a ‘must-have’ investment for all energy companies.

Global Reach, Local Service

We operate globally through our associated offices in Middle-East, Africa and Asia. We have operational offices in Pakistan and Head office in UAE (Abu Dhabi) and associated offices in 29 countries worldwide. With local staff and local knowledge, we are uniquely positioned to support companies that need to control operations remotely or in unfamiliar territories.

Providing a Complete Lifecycle Solution

Asset Integrity Life Cycle

Where we Fit

- Oil Refineries
- GOSP’s
- Gas & NGL Plants
- Chemical Plant
- Fertilizer Plants
- Pipelines
- Offshore Platforms
- Wellheads
- Structures
Our Services

**Asset Integrity Management Services**
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Asset Integrity Management Services

Risk Based Inspection (RBI)

For Oil & Gas, Power and Petrochemical Installations, Risk Based Inspection (RBI) is a systematic approach to create an accurate, well-targeted inspection strategy based on risk. The inspection plans are developed to mitigate the specific failure mechanisms identified.

RBI study is performed in compliance with standards API 580, 581, API 571. It is applicable to offshore & onshore installations such as fixed or mobile units as well as FPSO’s and pipelines.

- Pressure Vessels / Drums
- Heat Exchangers (Shell and Tube, Fin Fan)
- Columns
- Fillers
- Flare / Stack
- Storage Tanks
- Pressure Relief Devices
- In-Plant Piping
- Pipelines
- Offshore Structure

DELIVERABLES
- Corrosion Loop Drawings
- Inventory Group Drawings
- Corrosion and Inspection Strategy Document
- Risk Based Inspection (RBI) Report
- Inspection Isometric Drawings for Equipment and piping

Pipeline Integrity Management System

(Onshore & Offshore)

An overview of the features and philosophy of Pipeline Integrity Management System (PIMS) highlights pipeline regulations and codes which are normally based on safety as well as risk philosophy. The design requirements are established so as to fulfill the objectives of the safety standards. The set of design criteria may thus be seen as the practical interpretation of it.

Pipeline Integrity Management System is performed in compliance with international standards like API 1160, ASME B31.8S.

The Pipeline Integrity Management System program (PIMS) is developed for use by the pipeline engineers and for serving the following purpose:

- To monitor the technical and safety condition of the pipeline system.
- To define inspection frequency and technical content of inspection programs.
- To recommend pipeline intervention work or repair when needed.

DELIVERABLES
- Section Layout Drawings
- Mechanical Assessment Sheet
- Inspection Plan
- RBI Report (PIMS) Study
- Integrity Operating Window (IOW)
- Asset Passport

Structural Integrity Management System

Structures accommodate all the facilities offshore & onshore and are considered as one of the vital assets. Therefore, it is important to ensure its integrity.

Velosi offers services of Structural Integrity Management System to ensure that:

- The safety, environment and commercial risks associated with the operation of structures are identified and assessed.
- Appropriate risk reduction measures are identified, established and maintained.
- Risks to personnel, environment and business profitability are reduced to as low as reasonably practicable.
- Ensure that structural designs are fit for the intended purpose and engineered to approved standards.
- Assure the integrity of structures during all phases of their life cycle and assign single point accountability for this.

RBI Methodology adopted for structures risk assessment is based on criteria provided in international codes ISO 19900, ISO 19902 & ISO 19904, API RP 2 SIM

Velosi covers the following types of structures, as minimum:

- Offshore Platforms - Subsea Structures
- Offshore Platforms - Topside Structures
- Floating Production Storage and Offloading (FPSO)
- Onshore Structures

DELIVERABLES
- Tag Marked Drawings
- Asset Register
- Inspection Plans
- Asset Passport
- RBI Report (SIMS) Study

Safety Integrity Level (SIL)

Safety Integrity Level (SIL) is the discrete level for specifying the safety integrity requirements of safety functions to be allocated to the “Electrical/ Electronic/Programmable Electronic Systems” safety related systems where SIL 4 has the highest level of safety integrity and SIL 1 has the lowest.

SIL study is performed in compliance with standards IEC-61508, IEC-61511, ISA TR 84.00.02.

DELIVERABLES
- SIL Methodology
- SIL Classification Report
- SIL Verification Report
- Safety Requirement Specification (SRS)
- Safety Life Cycle
**Wellhead Integrity Management System**

Velosi uses FMECA based RBI Methodology for Wellhead Integrity Assessment. The methodology is developed in accordance with BS EN 60812, IEC 60812, OREDA, API 6A, API 14B, API 14C, API RP 57 and ISO-TS-116530-2 to optimize the preventive maintenance activities.

In the context of well integrity, Velosi recommends use of reliability analysis methods that can be used to identify and assess the impact of failures of well barrier elements.

Such analysis are useful for:

- Comparing different well maintenance alternatives with respect to blowout probabilities
- Evaluating the blowout risk for specific well equipment
- Identifying potential barrier problems in specific well types
- Assessing the effect of various risk reduction methods
- Identifying potential barrier problems during well interventions/maintenance activities

Velosi uses FMECA approach to answer the following questions:

- In what ways can system components fail?
- What are the underlying causes of failures?
- How can failures be detected?
- What are the failure effects, on the failed component and on the system?
- How critical are the failure effects, in terms of damage to humans, the environment, or material assets?
- What are the common industrial practices to mitigate the failures against identified mechanisms?

**Deliverables**

- Formulation of Asset Register
- Identification of applicable damage mechanism / degradation mechanism
- Risk Ranking & Calculation of criticality based on calculated PDF & COF
- Development of inspection plan against calculated criticality factors

**Reliability Centered Maintenance (RCM)**

RCM is a formal method to determine the maintenance requirements of an asset in its operating context. It stresses a proactive approach to maintenance while attempting to match best maintenance practice to mitigate a potential failure relative to the importance of preventing that failure.

RCM study is performed in compliance with standards BS EN 60812, SAE JA1011, SAE JA 1012, ISO-14224 & OREDA

If performed properly, RCM will:

- Maximize safety and environmental health
- Reduce overall maintenance cost
- Improve realized reliability/availability

**Reliability Availability Maintainability Services (RAM)**

Velosi provides detailed Reliability, Availability & Maintainability (RAM) analysis, to optimize a system by reducing the downtime, increase efficiency & optimize maintenance plans. RAM study is performed as per OREDA, ISO-14224, BS-5760, BS-EN 61703, BS 4778-3.

The ultimate purpose of RAM study is asset management; that is, running the system at maximum efficiency with minimum cost. RAM refers to three related characteristics of a system and its operational support: Reliability, Availability, and Maintainability.

The RAM study provides a statistical foundation for each asset’s contributions to the overall system availability and reliability.
Health Safety & Environmental Critical Equipment Systems

HSECES are those equipment systems whose failure could cause or contribute to an accident with severe or catastrophic consequences or whose purpose it is to prevent or limit the effect of such an accident. HSECES are developed through Bow-tie Analysis study.

**DELIVERABLES**
- Identification of HSECES
- HSECES performance standards for all identified HSECES
- ICP Audit for HSECES Verification
- Quality Performance Standards

Risk Assessment & Management

Velosi has extensive hands-on experience in a wide variety of risk assessment and risk management applications. The concept of Safety Case Development was a result of the Piper Alpha disaster. We have carried out several Safety Cases for offshore and onshore oil & gas installations. Quantitative Risk Assessment (QRA) studies for major hazards industries onshore and offshore have also been executed.

**DELIVERABLES**
- PHA studies
- Quantitative Risk Assessment (QRA)
- Safety Case Development and Review
- Modeling of dispersion, fire, explosion & toxic releases
- Safety Audits, Drop Object Surveys, Work at Height Audits and Rig Move Audits
- OHSE Audits inspection and Survey for onshore & offshore facilities

Occupational Health

Velosi occupational health and hygiene specialists have extensive experience in providing practical help and guidance to a wide range of industries. They can provide support and assistance by identifying and assessing the risks and developing cost-effective control strategies.

**DELIVERABLES**
- OHID Workshop Report
- OHRA Report
- Noise Survey and Assessment
- Biological Agent Assessment

HSEIA Studies

Velosi Health, Safety & Environment Professionals assist clients to develop the processes and procedures necessary to manage Health, Safety, and environment in their workplace. We have the knowledge and practical experience to benchmark your current competence for the on-going identification, evaluation, and control of risks in your workplace.

Velosi carries out HSEIA Studies for the whole life cycle of the project (i.e. four stages) as per local regulatory authority and clients standards & procedures.

- Conceptual Design & FEED Stage
- Detailed Engineering & Construction (EPC) Stage
- Commissioning Stage
- Operation Phase
- Decommissioning/Disposal and Site Restoration Stage
- Combined Phase

**DELIVERABLES**
- HZES, ENV/ OHS Workshops Reports
- HZES/ENV/ OHS Register
- HSEIA Workshop (BOWTIE, ALARP, SIMOPS & MOPO) Reports
- Emergency System Suitability Analysis (ESSA) Report
- Emergency Response Plan (ERP)
- Pollution Prevention & Control (PPC) Compliance Report
- Air Dispersion Modeling Report
- OHRA Report
- QRA Report
- FSA Report
- Environmental Impact Assessment (EIA) Report
- Evacuation Escape & Rescue Analysis (ESSA) Report
- Noise Assessment Study
- COMAH Report
- Waste Management Plan
- Fire & Gas Mapping Study
- Drop Object Study
- HSE/ES Performance Standards
- HSEIA Report
- Hazard Workshop & Report
- HSE Dispersion & Zoning Study
- Human Factor Engineering Assessment Study Report
- Ergonomics Study Report
- Building Risk Assessment (BRA) Study
- Explosion Risk Assessment
- Gas Dispersion Analysis
- HSEIA management system (HSEMS) review and Report
- HSEIA Screening Report
- PHSEIR Workshops & Report
- Project HSE Plan
- Construction HSE Plan
- Review & update of HSEIA Reports
Emergency Management & Planning

Velosi provides Emergency Management & Planning services for dealing with all humanitarian aspects of emergencies (preparedness, response, mitigation, and recovery). The aim is to reduce the harmful effects of all hazards, including disasters.

Particular areas of experience include:
- Review of Existing Plans & Policies
- Assessment of Emergency Preparedness
- Composing & Producing Emergency Plans

Environmental Services

While every development leaves a footprint on the natural world, better practices and more balanced approaches reduces the impressions on the Environment and preserves the resources for future generations. By implementing effective management and monitoring guidelines and ultimately complying with local and international guidelines, the industries can significantly reduce impacts on the environment.

Velosi offers comprehensive tailor made Environmental solutions ranging from Environmental Impact Assessment to Baseline Monitoring Surveys Waste Consultancy and Environmental Audits. Our approach in Environmental services starts from the consideration of environmental aspects at design stage, from problem clarification to project completion - keeping costs to a minimum.

Our multi-diverse pool of Environmental Engineers, Scientists, Environmental Regulatory Experts, Process Safety & Loss Prevention Engineers have decades of experience around the world in conducting Environmental studies for infrastructure & utilities, industrial and manufacturing plants, Oil & Gas projects and other specialty projects can help you meet your strategic and regulatory requirements and to grow your business through environmentally responsible infrastructure & utilities, industrial and manufacturing plants, Oil & Gas projects and other specialty projects can help you meet your strategic and regulatory requirements and to grow your business through environmentally responsible.

As a Class A Environmental Consultant registered with Environmental Agency, Abu Dhabi (EAD), Velosi’s most recent relevant work includes EIAs for Oil & Gas projects, Airports and Industrial Plants.

DELIVERABLES
- Emergency Management Procedure
- Emergency Management Plan

Engineering Services

Conceptual Design, FEED, Detailed Design and Engineering Consultancy Services

Core requirement of any engineering project is its Conceptual Design or Feasibility Study. Boundaries are defined at this stage for further Front End Engineering Design (FEED). In FEED, main focus is on the technical requirement along with estimated budget investment cost of the project. FEED also serves as the basis for the bidding of Execution phase contracts i.e EPC & EPIC.


DELIVERABLES
- Process PFD
- Equipment Piping Design Report GA & Detail Drawings
- Civil & Structural Pipe Bridge Structural Framing Plans and Elevations
- Piping Piping General Arrangement 
- Piping Piping Stress Analysis Report and Supporting Piping Design Calculation - 3D model
- Instrumentation & Control Datasheet for TT, FT, Gas Analyser, Chromatograph and EID Instrument Location Drawings
- Electrical Instrument Index
- Electrical Instrument Cable List
- Electrical Instrument Installation Detail Drawings
- Electrical Loop Diagrams
- Electrical DCIS/SCADA Modification
- Electrical Single Line Diagrams (SLDs)
- Electrical Schematics
- Electrical Wiring Diagrams
- Electrical Earthing Diagrams
- Electrical Cable Layout
- Electrical Cable Schedule

Operating Manuals and Procedures

The Operating Manuals and Procedures are an essential element of plant operations as they are developed to ensure smooth operation, production enhancement by reducing the downtime and to protect the integrity of plants. The operating manuals and procedures are formal written instructions that describes how particular plant should be operated, the expected performance targets, associated risks and key roles & responsibilities of key contributors in the plant’s operation.


DELIVERABLES
- Operating Manuals
- Operating Procedures
Engineering Services

Design Verification & Appraisal
Velosi offers independent third party services in Design Appraisal to streamline the design and construction process by reviewing design and drawings in compliance to international Codes, Statutory Regulations and Client Specifications all with a view to identify and correct design discrepancies in advance of procurement and fabrication. Design Verification & Appraisal are performed in compliance with standards TEMA, ASME Section VIII, ASME B31, ASME B31.1, ASME B31.3, ASME B31.4, ASME B31.8, API 620, API 530, API 650, & other industrial codes & standards.

DELIVERABLES
- Design Verification Report

Fitness For Service (FFS)
FFS assessments are quantitative engineering evaluations that are performed to demonstrate the structural integrity of an in service component that may contain a flaw or damage. FFS assessments are performed in compliance with standards API 510, API 530, API 653, API 570, API 579, ASME FFS-1, ASME B31.4.

DELIVERABLES
- Inspection Report
- RLA Calculation
- FFS Assessment calculation as per API 579
- RLA & FFS Study report including all inspection & test result

As-Built & Drafting Service
Subsequent to construction or modification of any facility, all relevant Engineering drawings, associated documents and schedules are required to be updated to As-Built status in order to represent the actual installation. Velosi is experienced in performing site walk through to perform Red Line Markup (RLMU) and updating drawings in Drafting intelligent softwares i.e. AutoCAD, SmartSketch, Smart Plant P&IDs (SPPID), Smart Plant Instrumentation (SPI), Smart Plant Electrical (SPE), PDMS, PDS, SP3D.

DELIVERABLES
- RLMUs
- Updated Native Files
- Updated Database/Model
**Software Solutions**

**VAIL-Plant (Asset Integrity Management System)**

VAIL-Plant is a robust and comprehensive Asset Integrity Management software tool, customizable to the needs of Energy Sector. The software is SAP certified and can be easily integrated with ERP software, such as SAP and MAXIMO. It is also certified by EXIDA, for compliance with IEC 61508, API 580 and ASME B31.8S.

We have a proven track record of working with major Oil & Gas Operators like LUKOIL, DRAGON OIL, TANAP, ADGAS, Groupment Berkine, PETRONAS and many others.

VAIL-Plant software is based on modular approach, covering all types of assets in oil and gas industry. The modules include but not limited to:

- **PEMS** - Pressurized Equipment Management System
- **PIMS Onshore** - Pipeline Integrity Management System for Onshore Pipelines
- **PIMS Offshore** - Pipeline Integrity Management System for Offshore Pipelines
- **EIRMS** - Electrical, Instrumental and Rotary Management System
- **ISMS** - Inspection Scheduling Management System
- **SIMS** - Structure Integrity Management System
- **PSVMS** - Pressure Safety Valves Management System
- **WHIMS** - Well Head Integrity Management System
- **HIMS** - Hull Integrity Management System
- **LEMS** - Lifting Equipment Management System
- **CIMS** - Civil Inspection Management System
- **CPMS** - Cathodic Protection Management System
- **FRIMS** - Flexible Riser Integrity Management System
- **FSIR** - Facility Status Integrity Reporting

**PIMS (Pipeline Integrity Management System)**

VAIL-PIMS is a composite application for off-shore and on-shore pipelines designed for Pipeline Integrity and Inspection Management.

It includes the following features:

- Pipeline profile recording & plotting
- Probability of Failure (POF) calculation and plotting along the pipeline (POF Vs TIME) against applicable damage mechanism
- Consequences of Failure (COF) calculation against applicable damage mechanism
- Risk Assessment against Stress Corrosion Cracking (SSC)
- External and Internal Corrosion Direct Assessment (ECDA & ICDA)
- Risk Assessment against third party damage
- Corrosion calculation (NORSOK M-506)
- Scheduling of integrity management and inspection

**PEMS (Pressurized Equipment Management System)**

VAIL-PEMS includes comprehensive database for piping and pressurized equipment such as vessels, tanks, heat exchangers etc. It facilitates Risk Assessment, Inspection and predicts the assets remaining and next inspection date.

It includes the following features:

- Engineering data capturing along with hierarchy management drawings, isometrics, PFD's and P&ID's
- Semi quantitative RBI methodology for risk evaluation and inspection planning against identified damage mechanisms compliance with API ST. 580
- Inspection history recording with respect to multiple positions and TML's
- Estimated Corrosion Rate Models based on API 581
- Failure and replacement history recording
- KPI's identifications and calculation/evaluations.
- Short term/long term corrosion rate & remnant life calculations
- Trends and console reporting
- Plant Inspection Requirements (PIR) generation
- Root Cause Analysis (RCA) against failures
- Data importing from excel workspace template
Software Solutions

SIMS (Structure Integrity Management System)

VAIL-Plant SIMS (Structure Integrity Management System) module contains following main features:

- Facility Information
- Engineering and Design information of complete structure
- Maintains the hierarchical tree to provide better understanding of the structure's components according to their levels
- Complete history recording of previously done inspections
- Plant Maintenance Routines and logistics requirements
- Inspection Management
- Inspection Flow Management
- RBI Assessment

EIRMS (Electrical, Instrumentation and Rotary Management System)

VAIL-Plant has a module of Reliability Centered Maintenance (RCM) for electrical, instrumentation and rotary equipment like compressor, pump, turbine, generator, motors, panels, transmitters, control valves etc. It includes:

- Facility Information
- Engineering and Design Parameters
- Equipment Hierarchy
- Failure mode and effects analysis based on equipment type
- Failure mode, effect and criticality analysis and risk matrix
- Mean Time Between Failures (MTBF) and Mean Time To Repair (MTTR) calculation
- Reliability operator and reliability generic data recording
- Inspection history recording
- Maintenance history recording
- Failures and Replacements recording
- Work order and work packs generation task lists with bom/spanes
- Functional data recording
- Plant Maintenance Routines (PMR) generation
- Effective Reporting

VAIL-PHA (Process Hazard Analysis)

- Safety Integrity Level (SIL) is the discrete level for specifying the integrity requirements of safety functions to be allocated to the “Electrical/Electronic/Programmable Electronic Systems” safety related systems where SIL 4 has the highest level of safety integrity and SIL 1 the lowest.

- HAZard and OPerability (HAZOP) analysis, is a structured technique to perform a systematic study of a process, using guide words to discover how deviations from the design intent can occur in equipment, actions, or materials, and whether the consequences of these deviations can result in a hazard.

- What if
- FEMA
- RCA

PSRA has been developed according to the guidelines in the standard HS(G) 146: Dispensing Petrol - Assessing and controlling the risk of fire and explosion at sites where petrol is stored and disposed as a fuel.

It acts as a useful checklist to be sure that precautionary measures are in place and are practically observed during operations. It is a recommended practice to carry out a reassessment of the Petrol station on a regular basis.

PSRA incorporates the following five steps recommended in the standard HS(G) 146, providing a systematic approach to looking for hazards and managing risk.

1. Analyze the site, its design, operation, and surroundings to identify where a fire and explosion hazard may exist.
2. For each area of the site and operation, consider: What could go wrong and Who could be affected?
3. For each finding from the previous step, assess if the current precautions are enough or if more needs to be done.
4. Record each finding and any action to be taken
5. Decide when there is need to review the Risk assessment

VAIL-PSRA (Petrol Station Risk Assessment)

VAIL-MTS is a fully functional software for organizing and tracking Materials in different discipline related to Oil & Gas Industry. It has a feature of documents management, reporting and integration with third party software tools like MAXIMO, Oracle and SAP.
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Note: Services related to HSE & Fire Quantitative Risk Assessment, Safety Integrity Levels, and Integrity Management Systems are detailed in the services list.
Objective

ADNOC Refining intended to carry-out Integrity and Remaining Life Assessment in one of its Boilers (Tag No. 421-B-001C) of Refinery Unit Plant at Ruwais Refinery East.

The objective of this project is to perform Boiler Integrity and Remaining Life Assessment, identify integrity related issues, and provide recommendations to ensure continued safe and uninterrupted operation at least for the next 10 years.

Scope of Work

- Assessing the present condition of the main boiler parts and accessories by way of Condition Assessment study and Remaining Life Assessment study.
- Analyzing the data collected and predicting the Residual Life of the boiler for reliable and safe operation.
- Recommending specific corrective actions and predictive maintenance actions to restore/increase the useful service life of the boiler.
- Predicting expected life after implementation of the recommended actions.

Deliverables

1. Destructive and Non Destructive examination results
2. Integrity Assessment of the Boiler components by following activities:
   - Visual Inspection
   - NDT Reports
   - In-Situ Metallography Inspection
   - Deposit Scale Analysis
   - Fiber Optic Inspection
   - Tube Sample Tests
3. Remaining Life Assessment calculations and results of all components
4. Recommendations for a safe operation of the boiler

Our Case Studies

Integrity and Remaining Life Assessment (RLA)
of HP Boiler At Ruwais Refinery (EAST)

Consultancy and Professional Services Agreement for
Update Operating Manuals & Procedures for ADNOC
Onshore Fields, Terminals & Pipelines - Full
Implementation Across ADNOC Onshore Assets.

Objective

For each of its operating sites, ADNOC onshore has Operating Manuals (OMs) and Operating Procedures (OPs) that were developed progressively over the last 40 years, part of the phase-wise field development plans. As a result of the integrity benchmarking exercise of existing OMs, it was recommended to update the OMs and OPs to reflect the new modifications & expansions to existing facilities.

ADNOC onshore hired Velosi to Update Operating Manuals and Operating Procedures to allow ADNOC onshore to carry out Operation activities in a safe manner and to sustain the integrity of its Asset.

Scope of Work

- Develop an E-Learning system that will enable young engineers to understand the design features, functionality and key parameters that affect the operation performance of key process equipment.
- Upload of E-Learning Modules on the ADNOC onshore interactive Learning Management System (LMS).
- Train Assets’ Operation staff on how to use and update the new Operating Manuals and E-learning Modules.
- Monitor and support the deliverables and implement necessary enhancement.

Deliverables

1. Project Definition Report
2. Operating Manuals (Total Qty.: 64 No.s)
3. Operating Procedure (Total Qty.: 856 No.s)
4. 2D E-Learning Module (Total Qty.: 35 No.s)
5. 3D E-Learning Module (Total Qty.: 42 No.s)
6. Population of web Based Framework and LMS
7. Monitoring & Training

Our Case Studies

Consultancy and Professional Services Agreement for
Update Operating Manuals & Procedures for ADNOC
Onshore Fields, Terminals & Pipelines - Full
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Consultancy and Professional Services Agreement for
Update Operating Manuals & Procedures for ADNOC
Onshore Fields, Terminals & Pipelines - Full
Implementation Across ADNOC Onshore Assets.
Updating of Critical Drawings for Zirku Island, Abu Dhabi

Objective

ZADCO facilities were designed and built in the early 1980’s. During the past, many changes and improvements have been made to these facilities. As a result of the uncontrolled process on drawing production by consultants/engineers, most of the drawings are of poor quality with out-of-date and/or duplicated data, each carrying different information pertaining to the project, it was originally produced for.

ZADCO hired Velosi to perform 3D Laser scanning and production of Primitive 3D model. This also includes the preparation of As-built of critical drawings.

Scope of Work

- Laser Scanning
- Creation of 3D Panoramic (360 degrees) view of the facilities in color, capturing all As-built physical data
- Creation of a Primitive 3D Model (As-Built) from the Laser Scans
- Generation of a complete package of a master “As Built” drawings from “Primitive 3D Model”

Deliverables

1. Design Document Report: (including)
   - Primitive 3D model
   - Piping and mechanical drawings
   - Electrical, Instrumentation and Telecom drawings
   - Electrical TSD Drawings
   - SLDS
   - Cable Schedule
   - Telecom Drawings
   - Instrumentation Drawings
   - Fire protection equipment/ safety equipment/ escape route layouts

Design Review of Natural Gas pipework for construction of a building at Sector RBW-7, Plot C25, Al-Raha Beach, Abu Dhabi

Objective

There are eight (08) floors in the mixed use residential building, which is to be constructed at Sector RBW-7, Plot C29, at Al-Raha beach, Abu Dhabi. Hannover Consulting Engineers is the main consultant hired to perform third party design reviews design of Natural Gas pipework in the building as per ADNOC specifications. This includes of drawings, hydraulic calculations for all the retail and residential gas connections as per ADNOC guidelines.

Scope of Work

- Conceptual design review of the pipework in the building.
- Review of hydraulic calculations.
- Review of the schematic drawings and gas layouts.
- Review of the typical details for below ground and above ground pipe network.
- Compliance certificate for ADNOC approval.

Deliverables

1. Design Document Review Report: (including)
   - Approved Schematic Drawings and Gas Layouts
   - Compliance certificate as per ADNOC standards
   - Pipework Design verification
   - Reviewed Design Calculations
   - Findings and Conclusions

Our Case Studies
Objective
ADOC has carried out HSEIA for its offshore facilities as per ADNOC CoP V1-02. The study has recommended some control measures to prevent, control and mitigate the major accident events. One of the recommendations was to review the design and adequacy check of fire protection system of ADOC offshore facilities.

In order to close out this recommendation ADOC has carried out Fire Risk Assessment (FRA) study. The study has reviewed existing Fire protection systems and has produced GAP report with options of implementation of GAP. ADOC intends to implement the recommendation of the GAP report in Phases over the next 5 years.

Scope of Work
- To produce technically viable, cost effective designs and technical documentation for Fire Risk Assessment Implementation (Phase-1) at Mubarraz field, Umm Al Anbar Field (AR), Neewat Al Ghalan Field (GA) and Central Facilities Platforms (CFP)
- To prepare EPC contracting documentation for implementing the above designs
- To generate cost estimates for the additions and modifications to the existing systems
- To establish the long lead items and prepare bid documentation for the same
- To update the project execution strategy and an optimum execution schedule

Deliverables
1. Fire & Gas Mapping Study
2. Sprinkler System
3. Fire Water Curtain
4. Fire & Gas Block Diagrams
5. Data Sheets
6. Fire & Gas Layout
7. Instrument Index
8. Method Statements
9. Specifications
10. Schematics
11. Material Take Off (MTOs)
12. EPC Costing Sheets

Our Case Studies

Basic Engineering Study for Fire Risk Assessment Implementation (PHASE-1)

Objective
BeAAT expansion is the up gradation of existing facility owing to increased future treatment/disposal requirement of Hazardous Waste generated from ADNOC Operating Companies (OPCO’s). A HSEIA Study shall be prepared which will describe how to design for HSE integrity, and shall be prepared in accordance with ADNOC CDPV1-02.

Scope of Work
Identify the hazards inherent in the operation of the facilities/plant/equipment etc. through hazards identification techniques such as HAZID (including safety, environment and occupational health hazards), HAZOP etc. Quality Performance Standards shall be set up for the above standards.

Build a Hazard & Effects Register with the classification of these hazards into High, Medium & Low risk. All “Severe” & “Catastrophic” severity hazards and “Critical High Risk” hazards will form Major Accident Hazards (MAH).

Build Bow-ties for the MAH to identify the HSE Critical Equipment Systems and HSE Critical Activities.

Perform suitable and sufficient risk assessments and demonstrate ALARP.

Develop HSECES Performance Standards with the related HSE Integrity Activities and Written Scheme of Examination.

Deliverables
1. HAZID/ENVID/OHID Workshops & Reports
2. Bow-Ties Workshop & Report
3. ALARP Workshop & Report
4. Simultaneous Operations (SIMOPS) workshop & Report
5. Environmental Impact Assessment
6. Fire Risk Analysis
7. Quantitative Risk Assessment Report
8. Pollution Prevention and Control Report
9. Noise Assessment Study Report
11. Air Dispersion Modelling and Assessment Report
12. HSECES identification, Performance standards & written scheme of examination
13. Control of Major Accident Hazards (COMAH)
14. Emergency Response Plan
15. Fire & Gas Mapping Study
16. Evacuation, Escape and Rescue Analysis (EERA)
17. Emergency System Survivability Analysis (ESSA)
18. HSEIA Report

Our Case Studies

BeAAt Expansion Project - Health, Safety and Environmental Impact Assessment (HSEIA) Study
Objective

The objective of the CONTRACT is to provide a technical survey and HSEF QRA study for the Facilities. The technical survey shall enable QP to be aware of the current risk status (non conformities) in the Facilities by department and asset. The findings of the technical survey shall be carried forward into the HSEF QRA study which outcome shall be risk-based recommendations for risk reduction (closing of gaps to ALARP) where necessary with clear, feasible and prioritized recommendations consisting in potential corrective measures/actions and improvements for risk reduction to ensure safe operations.

Scope of Work

Phase I:
To conduct a base line technical survey of the Facilities which findings shall be further used as input to the HSEF QRA study. The survey shall enable QP to be aware of the current risk status and non-conformities.

Phase II:
Upon completion of the Phase-1 (Technical Survey) and approval by QP of related deliverables, the next phase shall be the execution of the HSEF QRA study for all Dukhan Facilities.

Phase III:
To conduct QRA study for 37 critical pipelines & 73 critical wellheads.

Deliverables

1. Technical Survey Reports of all Dukhan Fields (20 facilities)
2. Quantitative Risk Assessment Reports of all Dukhan Fields (20 facilities)
3. Combined Quantitative Risk Assessment Report for all Dukhan Fields (20 facilities) & 37 critical pipelines & 73 wellheads

Our Case Studies

HSE & Fire Quantitative Risk Assessment Studies For Dukhan Fields

Client: Qatar Petroleum
Location: Dukhan, QP Qatar
Region: Middle-East
Services: Quantitative Risk Assessment (QRA)

Our Case Studies

The Study Of Verification Of Safety Levels Intelligences (SIL) All Instrumented Functions Safety Complex GL1Z, GL2Z, GL1K, GP2Z And GP1Z

Client: Sonatrach
Location: Arzew and Skikda, Algeria
Region: Africa
Services: Safety Integrity Level (SIL) studies

Objective

Sonatrach decided to carry out SIL Study of all safety instrumented functions for Complexes GL1Z, GL2Z, GL1K, GP2Z and GP1Z and the training of the Client's staff in IEC61508 and IEC 61511, for intended safety and fit for purpose for the next 20 years.

Scope of Work

1. Conducting Training Standards IEC 61508 And IEC 61511, by an accredited consultant
   1. Requirements of the standard 61511
   2. Risk processing instrumentation/control -identification of SIS and required SIL
   3. Design/Commissioning/editing and analysis tools SIS (Safety Instrumented System)
   4. Managing the safety lifecycle (Maintenance and Operation of SIS)
2. SIL calculation software with license and training operations
3. Conduct review SIL instrumented safety functions

Deliverables

1. Finalisation of IEC 61508 and 61511 Training
2. Delivery of "VAIL-SIL" software
3. SIL classification/verification study Reports
4. Safety Requirements Specification Document
5. Safety Lifecycle Document
Asset Integrity Management System Aims for Onshore and Offshore TANAP Assets

**Objective**
To provide Asset Integrity Management System (AIMS) for TANAP Gas Pipeline & Stations to manage the operational risk for gas to flow safely along 1850 kilometer pipeline traveling from Azerbaijan through Turkey and onto Europe.

Development of an Asset Integrity Management Software to enable TANAP to schedule, prioritize and execute the inspection plan along with database management and data collection for Risk Assessment.

Integration of AIMS Software with TANAP’s SAP, GIS & Envision.

**Scope of Work**
Establish a comprehensive Risk Based Inspection (RBI) Program based on best practices and industrial standards to effectively manage corporate assets in order to gain maximum value, profitability and returns while safeguarding personnel, the community, and the environment.

AIMS:
Conduct corrosion monitoring and control, software installation, development of inspection drawings and training of TANAP personnel in order to ensure proper long-term management of AIMS.

VAIL Plant Software:
Provision and Implementation of VAIL Plant Software to continually manage AIMS for TANAP Facilities.

**Deliverables**
1. Asset Integrity Management System:
   - Comprehensive RBI Program for On-Shore Phase-0 (1350km), along with Results and Conclusions
   - Remnant Life Assessment
   - Defect Assessment
   - Inspection Plan
   - Failure Rate and Risk Allocation
   - Comprehensive RBI for Fixed Equipment at Stations
   - FMECA Study & Maintenance Plan for PSVs
   - Written Schemes of Examination (WSOE)
   - Standard Operating Procedures (SOPs) & Asset Integrity Management Documents
   - Comprehensive of full AIMS Training for RBI to TANAP personnel by Velosi

2. VAIL Plant Software Modules:
   - PEMS – Pressurized Equipment Management System
   - PIMS – Offshore Pipeline Integrity Management System
   - PIVMS – Pressure Safety Valves Integrity Management System
   - ISMS – Inspection Schedule Management System

Velosi successfully integrated VAIL Plant Software with TANAP’s SAP, Envision and GIS software and achieved GO LIVE of VAIL Plant Software (PEMS, PIMS& PIVMS & ISMS) before Commercial Operations Date (COD)

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RBI Implementation Project With Provision of Software and Associated Services

**Objective**
Provide Inspection Guidelines for GB assets and establish Standard Operating Procedures for safe execution of various inspection activities whilst maintaining quality at GB HBNS and El-Merk Facilities.

Customization of Asset Integrity Management System (AIMS) Software to enable GB to schedule, prioritize and execute the inspection plan along with database management and data collection for Risk Assessment.

**Scope of Work**
1. RBI:
   - Establish a comprehensive Risk Based Inspection (RBI) Program for Pipelines, Pressurized Equipment and Piping at HBNS and El-Merk facilities based on best practices and industrial standards to effectively manage corporate assets in order to gain maximum value, profitability and returns while safeguarding personnel, the community, and the environment.

2. FMECA:
   - Implementing an FMECA based Risk Assessment Methodology for Pressure Safety Valves and Wellheads at HBNS and El-Merk facilities to optimize the preventive maintenance activities.

3. VAIL Plant Software:
   - Provision, Implementation and Management of VAIL Plant Software to continually manage assets for GB for HBNS and El-Merk Facilities.

4. Training
   - Comprehensive Training and hands on familiarization of GB Engineers during implementation and development of designated software at GB Facilities.

**Deliverables**
1. Asset Integrity Management System:
   - Risk Based Inspection (RBI) Study at GB HBNS and El-Merk Facilities along with Results and Conclusions for the following assets:
     - Equipment & Piping

2. FMECA Study & Maintenance Plan for Wellheads and PSVs at:
   - HBNS and El Merk Facilities along with Results and Conclusions

3. Preparation of Standard Operating Procedures (SOPs)

2. VAIL Plant Software Modules:
   - PEMS – Pressurized Equipment Management System
   - PIMSON – Pipeline Integrity Management System – On shore
   - PIVMS – Pressure Safety Valve Management System
   - WHIMS – Wellhead Integrity Management System
   - ISMS – Inspection Schedule Management System
Our Case Studies

Pipeline Integrity Management Program for SNGPL

Objective
Strategize a Pipeline Integrity Management Program (PIMP) for SNGPL’s pipelines and stations in order to equip SNGPL with a transparent and auditable working method to identify degradation mechanisms while proposing effective risk mitigation of earmarked assets.

Development of Pipeline Integrity Management Program (PIMP) Software in accordance with ASME B31.8S.

Scope of Work
PIMP:
Development of Pipeline Integrity Management Manual in line with ASME B31.8S. Implementation of PIM Program (PIMP) includes all the required field surveys & activities for 2 Buried Pipelines, Sales Metering Station & 1 Over Head River Crossing Line.

Training:
Comprehensive Training and hands on familiarization of SNGPL Engineers and IT Officer during development, implementation of PIM Manual and designated software.

VAIL Plant Software:
Development of customized software in accordance with ASME B31.8S for various modules.

Deliverables
1. Asset Integrity Management System:
   - Implementation of PIM Program (PIMP)
   - PIM Manual (ASME B31.8S)
   - Comprehensive Training of VAIL-Plant software To SNGPL engineers
   - Preparation of Standard Operating Procedures (SOPs)

2. VAIL Plant Software Modules:
   - PEMS – Pressurized Equipment Management System
   - PIMSON – Pipeline Integrity Management System - Onshore
   - ISMS – Inspection Schedule Management System
   - EIRMS – Electrical Instrumentation Rotary Management System
   - CPMS – Cathodic Protection Management System

Our Case Studies

Risk Based Inspection Program Development for Petronas FLNG 1 (L) LTD. Topside Structure and Hull

Objective
Establish a Risk Based Inspection (RBI) Program for Topside Structure Including Turret, Hull Structure including Cargo Tanks, mooring system and flexible riser by carrying out comprehensive risk analysis.

Integration of recommended RBI IRP with class survey requirement including endorsement/approval from current Class Society.

Scope of Work
A Risk Based Inspection Program Development for Petronas FLNG 1 (L) LTD Topside structure and Hull Structure including for:-

Topside Structure Including Turret
Hull Structure Including Cargo Tanks
Mooring System
Flexible Riser
RBI Software

VAIL Plant Software:
RBI Software Package for risk assessment and recording of RBI data including inspection plan with database which shall be valid throughout the FLNG1 design life.

Deliverables
1. Risk Based Inspection Program:
   - Comprehensive RBI Study for Topside Structure.
   - Tag Marked Drawings for SIMS and HIMS.
   - Failure Rate and Risk Allocation
   - RBI Report with results and conclusions.
   - Recommendation on additional safeguards and action(s) where required.
   - Inspection plan comprising of inspection method, coverage and frequency.

2. VAIL Plant Software Modules:
   - SIMS – Structure Integrity Management System
   - HIMS – Hull Integrity Management System
   - ISMS – Inspection Scheduling Management System
   - Integration of VAIL-Plant Software with SAP
Our Case Studies

Integrity Management Software Development

Client: Dragon Oil
Location: Turkmenistan
Region: Central Asia
Services: Software Supply & System Implementation

Objective
In order to manage the integrity of assets, Dragon Oil required a robust ASSET INTEGRITY MANAGEMENT SOFTWARE tool to support all of its assets Onshore & Offshore Pipeline, Pressurized Equipment, Structures, PSVs, Electrical & Rotatory equipment. The software was intended to store all relevant data in accordance with industry or other relevant standards, allow for future upgrades and future developments of modules to enable a variety of analyses that are expected to be used for decision-making.

Scope of Work
- Software System Supply
- System Implementation
- Documentation
- Training
- Maintenance & Support
- Pilot study for Topside Equipment (94), Process Piping (160), Structures Platforms (3) and Pipelines (5)

The software should be able to integrate into the Oracle E-Business Suite applications database and handle inspection records for the following asset types:
- Pressurized equipment & Piping
- Pressure Safety Valves (future)
- Onshore Pipelines
- Jacket Structures
- Offshore Pipelines

Deliverables
VAIL-Plant Software, which is an Asset Integrity & Inspection Management Application developed on modular approach to meet all the objectives of Dragon Oil Turkmenistan Limited. The following modules of VAIL-Plant were successfully implemented for Dragon Oil Turkmenistan Limited along with training, User Acceptance Testing and pilot study:
- PEMS (Pressured Equipment Management System)
- PIMS-ON (Pipeline Integrity Management System Onshore)
- PIMS-OFF (Pipeline Integrity Management System Off-shore)
- SIMS (Structure Integrity Management System)
- CMMS Interface (ORACLE interface module)
- APMS (Asset Performance Management System)
- ISMS (Inspection Schedule Management System)
- PSVMS (Pressure Safety Valves Management System)
- EIRMS (Electrical, Instrumentation & rotary Management System)

Preventive Maintenance Optimization

Client: Dolphin Energy Ltd.
Location: Ras Laffan, Qatar
Region: Middle-East
Services: Reliability Centered Maintenance (RCM)

Objective
Dolphin Energy Limited (DEL) Qatar, hired Velosi to carry-out Reliability Centered Maintenance (RCM)/Failure Mode generic maintenance strategy per object type for assets at Company’s Ras Laffan Industrial City (RLIC) Onshore Facility in order to have an effective optimized maintenance strategy.

Scope of Work

Deliverables
1. Detailed Method Statement for full fledged RCM Study.
2. Detailed Method Statement for Failure Mode Task List/ Generic Task List based on Object Type.
3. SAP Templates
4. RCM Report with results and attachments;
   - Complete Asset Register
   - Dominant Failure Modes per Object type.
   - Failure Mode Criticality and Equipment Criticality.
   - PM task list per equipment per failure mode after rationalization along with task duration and resource requirement.
   - Preventive Maintenance manpower requirement and changes from existing PM manpower requirement.
   - Critical Spares Review for Full Fledged RCM Assets aligning with task list and failure mode.
Company Clients