

Report on HLS Asia Industrial Visit

Bachelor of Technology in Petroleum Engineering

by

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July-December 2025

Declaration

We declare that this written submission represents our ideas in our own words and where others' idea or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in our submission. We understand that any violation of the above will be cause for disciplinary action by the PANDIT DEENDAYAL ENERGY UNIVERSITY.

Name: _____ Sign: _____

Approval Sheet

This report titled "**Report on HLS Asia Industrial Visit**" is recommended for the credits of Industrial Orientation.

Sign of Examiners:

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Place: _____

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1 Introduction

1.1 Company Profile: HLS Asia

1.2 Gandhinagar Workshop Overview

1.3 Aim and Scope of Visit

2 Industrial Orientataion

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2.1 Introduction to Well Logging Services

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2.2 Applications and Significance of Well Logging

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2.3 Overview of Well Logging Tools

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2.3.1 Open Hole Tools

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Spectral Density Tool

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Induction Resistivity Tool

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Calliper Tool

Z

Neutron Porosity Tool

Z

Spectral Gamma Tool

Z

Circumference Acoustic Scanning Tool

Z

2.3.2 Cased Hole Tools

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Cement Logging Tool

Z

Perforation Gun

Z

2.4 Process of Well Logging

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2.4.1 Data Acquisition Van (Logging Unit)

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2.4.2 Data Acquisition and On-site Processing

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2.5 Tool Storage, Maintenance and Dispatch

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2.6 Health, Safety and Environmental (HSE) Management

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2.6.1 General Site Safety

General site safety protocols at the HLS Asia Gandhinagar Workshop form the foundation of all operational activities, especially because the facility handles high-value logging tools, heavy mechanical equipment, radioactive materials, and explosives. Personnel are required to wear complete personal protective equipment (PPE), including helmets, flame-resistant coveralls, safety shoes, high-visibility vests, goggles, and gloves before entering work areas. The workshop is divided into controlled access zones—Green, Yellow, and Red—each restricting entry based on operational risk, with the Red Zone reserved for hazardous materials and accessible only to authorized staff. Before the start of daily operations, safety induction sessions and toolbox talks are conducted to brief workers

about ongoing activities, potential hazards, emergency communication, and preventive measures.

All equipment handling is restricted to certified technicians who inspect hoisting and lifting tools before use. Fire safety measures are robust, with strategically placed fire extinguishers, functional alarms, and clearly marked evacuation routes. The workshop maintains high housekeeping standards by ensuring clean, hazard-free workstations, proper tool arrangement, and systematic waste segregation. Throughout all operations, documentation and compliance with HLS and OISD safety regulations are strictly maintained through logbooks, audits, and scheduled inspections. This strong HSE culture ensures safe operations and minimizes risks during all workshop activities.

2.6.2 Handling of Radioactive(RA) Sources

Radioactive sources used in well logging tools are handled under strict regulatory control following AERB guidelines. These sources are stored inside shielded lead containers placed within a dedicated RA bunker equipped with radiation signage, surveillance, and monitoring systems. Access to this area is highly restricted and permitted only to trained personnel holding valid AERB certifications. All handling of radioactive capsules, including loading and unloading into logging tools, is performed within controlled zones using specialized tools to minimize exposure. Radiation levels are continuously monitored using survey meters, area monitors, and personal dosimeters, and exposure records are updated monthly. Transportation of radioactive sources follows regulated procedures, using certified lead casks with tamper-proof seals, along with transport permits and chain-of-custody documentation.

In case of any radiation abnormality or suspected source breach, emergency protocols require immediate evacuation, activation of alarms, restricted entry, and assessment by the Radiation Safety Officer (RSO). Spent or expired radioactive sources are not stored locally; instead, they are returned to manufacturers or other AERB-approved disposal facilities. These strict measures ensure safe, compliant, and efficient handling of all radioactive materials in well logging operations.

2.6.3 Handling of Explosives(EXPL)

2.7 Present Market Status and Future Scope

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2.8 Competitors and Other Threats

The competitive environment for logging and wireline services is largely shaped by the speed of new technology, increasing digitalisation, and the dominance of international oilfield service companies. Academic research suggests that advanced logging tools which include spectral gamma ray, cement bond logs, and induction/neutron porosity tools are fundamental to subsurface evaluation workflows in the sector.

These tools require a high level of technical capability, on-going technology investments, and specialised skills, making entry for regional service providers such as HLS Asia problematic. Well-logging is a significant reference for reservoir characterisation and formation evaluation (Rider & Kennedy, *The Geological Interpretation of Well Logs*, Elsevier).

Research on spectral gamma ray (SGR) logging also emphasizes that leading companies have developed multi-detector gamma ray systems which are capable of more advanced lithology analysis and shale discrimination than traditional single detector systems (Klaja & Dudek, 2016). These are simply now the standard operating procedure on multi detector gamma ray systems from companies such as Schlumberger, Halliburton, Baker Hughes and Weatherford.

In a similar vein, cement bond logging work stresses the necessity of obtaining high quality CBL/VDL in order to ensure long-term well integrity (Saini et al., 2021). International contractors are continually upgrading their sonic based cement evaluation tools to enhance accuracy, reliability, and operational efficiency that clients will increasingly expect during tender evaluations.

One competitive threat is digital transformation. State of the art machine learning models can automatically execute functions such as synthetic log creation, lithofacies forecasting, and porosity prediction with high accuracy (Zhang et al., 2025). International service companies investing in modern day AI platforms have a clear competitive advantage compared to moderately sized companies without similar digital assets.

The research literature has also documented operational risks in wireline logging, such as tool failure, borehole washout, cement channeling, and depth mismatches. Bigger companies cope with these risks better because of experience, staff expertise, and redundancy in equipment. These situations, along with digitalisation and expectations from customers, are the most serious risks to HLS Asia in a competitive scenario.

3 Learnings from Industrial Visit

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3.1 Key Learnings

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3.2 Connections to Classroom Learning

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4 References