

HEAVY OIL BENCHMARKING STUDY

North America · South America · Central Asia · Middle East · Rest of World



- Uptime Reliability
- Operating Cost
- Best Practices
 - Artificial Lift
 - Water Management
 - Steam Generation

What Clients Say:

"We find the Ziff Energy reports to be comprehensive, well written, and most importantly, consistently objective ... The resulting analysis is of high quality and integrity ... Without the Ziff tools, we would find it very difficult to objectively measure."

Senior VP, Canadian Major

"The scope and format of the study assisted us in focusing on specific areas of improvement. The presentation of the results of the study was concise and informative and reflected considerable knowledge of operations ... As a result, we have been able to dramatically improve our operational efficiencies and lower our costs."

Vice President, Super-Major

"We got more than what we paid for, which is a pleasure to say. I would recommend this process to any company wanting to move from the 'also ran class' to 'best of class.'"

Operations Manager,
Independent Producer

"We are pleased with your work ... Ziff delivers the full package, a statistically rigorous analysis coupled with real suggestions that can be used to improve operating performance. It is refreshing to work with Ziff's staff, which consists of industry professionals who are knowledgeable and experienced."

Development Manager,
Large Independent Producer

HEAVY OIL BENCHMARKING STUDY

Ziff Energy Group - Upstream Benchmarking Experience

Ziff Energy Group has successfully executed 170+ upstream benchmarking projects, far more than any other consultancy. Ziff Energy has completed a number of heavy oil studies since 1993 (as referenced in SPE Report 30263). Over the last 17 years, with input from clients, we have evolved a robust process and best practices in benchmarking to ensure you receive a quality deliverable. Our experience leads to a set of highly relevant Cost Driver analysis, and strong reporting formats.

Study Scope

Ziff Energy will analyze each field against similar 'like kind' fields selected for this purpose from companies participating in the study and/or from our extensive field level database. The analysis will examine each cost category, establishing the performance "gaps" via diagnostic indicators. As part of this work, Ziff Energy will also focus on best practices related to three key challenging areas of producing heavy oil: Artificial Lift, Water Management, and Steam Generation. A "Production Reliability" analysis will also be performed.

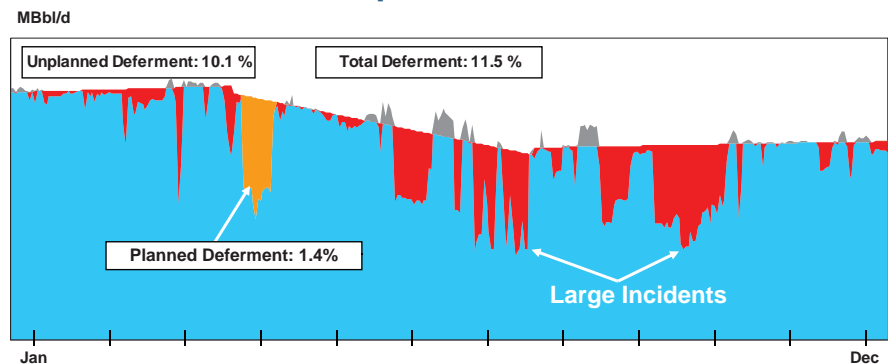
Peer Selection Criteria

Technical properties of each field are used to group fields that have similar producing and field structure characteristics. This approach has been used by Ziff Energy Group in its Operations Benchmarking for over a decade. Comparable fields are assembled into Asset Groups based upon up to 16 criteria including producing characteristics, such as API Gravity, Viscosity, Depth, Watercut, Artificial Lift, etc.

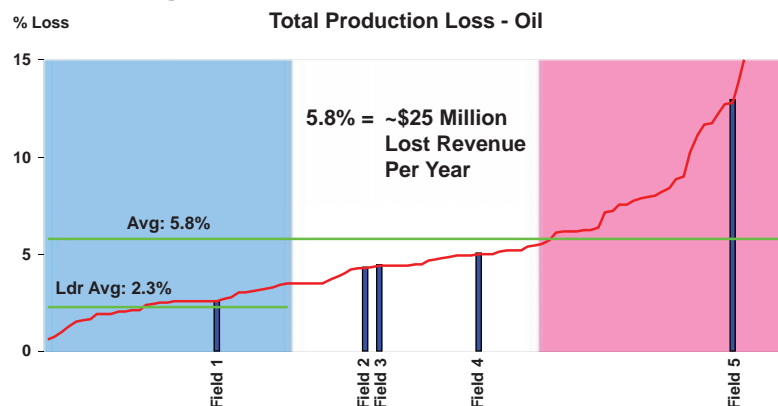
Uptime & Reliability

Our Reliability metrics are based upon an analysis of daily production data to identify downtime incidents (unplanned and planned), and lost production. Because Ziff Energy applies the methodology consistently to all assets, our approach removes the subjectivity and uniqueness of each operator's definition of their own internal reliability metrics. Ziff Energy's Reliability metrics, includes Mean Time Between Incidents (MTBI) and Mean Time to Repair (MTTR), are used to benchmark overall production performance and are based upon the production losses.

Sample Metrics - Planned vs. Unplanned Downtime & Production Deferment



Sample Metrics - Downtime Production Loss



Operating Cost

Each participating field will be analyzed against similar fields in their Peer Group. A technical analysis will be performed on the data submitted to determine high cost areas (the performance 'gaps') based on Ziff Energy's world field cost categories:

- Well Servicing
- Surface Repair and Maintenance
- Chemicals
- Contract Services
- Lease Fuel
- Labor & Field Services
- External Processing (if any).

Operating Best Practices

The main objective of this deliverable is not only to define the gaps between current practices versus best practices, but to delineate *practical recommendations* to enhance operating efficiency. Ziff Energy will undertake a comprehensive analysis of the following practices:

- Artificial Lift: ESP, PCP, and Others
- Water Management: Treatment and handling of thermal and non-thermal related water issues
- Steam Generation: central vs. satellite steam generation unit, technologies reliability of the system, etc.

Our Deliverables to you . . .

Customized Field-Level Production Analysis

- 'Uptime Reliability' Performance relative to peer fields & Operators
- Operating Cost Analysis for each field, identifying potential cost savings by cost category for each field
- Operating Best Practices related to Artificial Lift, Water Management & Steam Generation

Comprehensive Report

- Organized by multiple peer asset categories or groupings of similar fields
- Based on technical and operational characteristics
- Report will provide an insight into the best practices of leading operators which will result in the identification of performance gaps

Submit Data Electronically - Much Easier!

Our improved well and field cost data gathering approach is now based on your own data structure, so data retrieval is far easier, and fast! Ask us about the details of Electronic Data Gathering from your accounting and well data systems.

Private Debriefing

To help focus your team on immediate solutions.

Experienced Team

Operations Professionals with 20+ years experience have the knowledge and background to provide specific and actionable solutions related to heavy Oil operations.

"We encourage other operators to participate in Ziff Energy's multi-client benchmarking projects.

Some of the benefits are:

- *standardized cost data & peer field comparison*
- *points to areas where we may have gaps in performance*
- *the results encourage us to take a look at our operating metrics and understand the drivers and where to focus our time and efforts*
- *(uptime) reliability metrics*
- *automated data gathering takes effort away from staff, who are stretched these days."*

VP, Large Independent Producer

"Immensely impressive . . . much more detailed than other benchmarking studies."

President, Major

"We have been benchmarking with Ziff Energy for almost a decade now, so we are believers in the data. Our costs were still climbing... We thought we had good disciplines. We thought we were doing well, but the data told us otherwise... We asked them [Ziff Energy], to help out... to share some of the best practices they had seen in the industry..."

- *in 2009 & 2010, we managed to flatten our operating costs – the overall operating expenditure was a little bit lower than our growth*
- *in 2009, we saved \$23 million*
- *in 2010, we saved \$40 million."*

Technical Director,
International Independent

"The value for changes we implemented was estimated at \$5 million, a very good return."

Senior Engineer,
International Major

WORLD HEAVY OIL DEPOSITS



Source: Ivanhoe Energy & Ziff Energy Group

You are invited to participate in this effective analysis and gain the benefits

Please contact:

Sergey Turchin , Mgr, Operations Consulting

(cell at Heavy Oil Conference)

Juan Carlos Alba, Vice President, E&P Services

(403) 234-4298

(403) 619-7119

(713) 985-5189

sergey.turchin@ziffenergy.com

juancarlos.alba@ziffenergy.com

Why Ziff Energy?

Ziff Energy has completed 180+ multi-client studies, assisting 100+ E&P companies in 40+ countries to lower operating costs and increase production by comparing their field operating cost performance against similar gas or oil fields. To date, over 4,000 oil and gas fields, representing over \$30 billion in operating costs, have been analyzed in our field operations studies.

For 4 years, we have used Electronic Data Gathering to transfer data from your accounting system to Ziff Energy. Clients no longer complete cost spreadsheets. We cross reference your cost accounting codes to our standardized detailed set. The download of your cost data is loaded into the benchmarking categories using the code mapping. Transparency is enhanced, client effort dramatically reduced, and you can drill down into your own cost data to better understand your performance gaps.

Ziff Energy's Center for Benchmarking Excellence

In 2007, Ziff Energy established a unique World Upstream "Center for Benchmarking Excellence", to ensure that Ziff Energy studies for upstream operations are the best conceived and executed. The core group, mainly based in Calgary, comprises a full time cadre of Analysts, currently professional engineers and economists who each have 5-15 years of experience and a Masters or B.Sc. in Engineering or Economics. The group works with Project Managers, Directors, VP's, and Ziff Energy's team of International Associates, based in various countries, who each have 15-30+ years of E&P operations experience. They are supported by two full time IT team members and a leading desktop publishing team.

Ziff Energy Group, Calgary

Suite 180, 6025 - 11th Street SE

Calgary, Alberta, T2H 2Z2

Ph: (403) 265-0600 Fax: (403) 261-4631

Toll Free: 1-800-853-6252

e-mail: info@ziffenergy.com



Ziff Energy Group, Houston

4295 San Felipe, Suite 350

Houston, Texas, 77027

Ph: (713) 627-8282 Fax: (713) 627-9034

Toll Free: 1-888-736-5780

e-mail: info@ziffenergy.com

visit our website : www.ziffenergy.com