GLOBAL PROCESS AUTOMATION & INSTRUMENTATION MARKET IN OIL & GAS INDUSTRY

By Process Automation (SCADA, DCS, PLC & MES), Instrumentation, Analyzers, Flow Computers, Leakage Detection, Operation & Geography

– Analysis & Forecast (2013 - 2020)
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1 INTRODUCTION

1.1 REPORT DESCRIPTION

Automation is the use of information technology and control systems (computers and set of devices), by replacing the human operator with these systems, in order to control and regulate processes and instruments. In today’s scenario, it is hard to imagine the oil and gas production landscape without automated systems. Oil and gas industry requires massive automation at all stages, right from exploration to distribution. Demand for automation in the oil and gas industry will continue to increase due to the increased requirement for better control, performance, reduced downtime, and better safety system.

The growing demand for automated systems has increasingly shifted focus towards optimization in the areas of efficiency, low power consumption, and security features. This report covers market insights related to process automation and instrumentation market in the oil and gas industry. Process automation and instrumentation deals with automation of all the equipments and machineries involved in the production of oil and gas; and the major products that are covered under process automation are SCADA, DCS, PLC, and MES; and products covered under process instrumentation are flow transmitters, temperature transmitters, level transmitters, pressure transmitters; process analyzer includes liquid analyzer, gas analyzer, and gas chromatographs. Apart from all these, flow computers and leakage detection systems are also included under the scope of the report. Further, the report covers the oil and gas industry on the basis of an operation which includes upstream, midstream, and downstream.

In the oil and gas industry, there is always a great demand for safety and reliability. As for its supply chain, from exploration through delivery, there is a great demand for automation & instrumentation. This helps to integrate information, as well as to control, and provide power efficiency and safety solutions so as to respond to the global demand for affordable energy, meeting stringent government regulations, and driving down costs. The major driving factors for the process automation and instrumentation market in the oil and gas industry, which is expected to pay rich dividends in the coming years, include the need for energy efficiency, rising fuel prices, pressure to reduce cost, human safety, and the upsurge in the labour
charges. Major companies involved in process automation & instrumentation in the oil and gas industry include Honeywell Process Solutions (UK), Rockwell Automation (U.S.), Emerson Process Management (U.S.), Siemens AG (Germany), and Yokogawa (Japan).
EXECUTIVE SUMMARY

Automation is the use of information technology and control systems (computers and set of devices), by replacing the human operator with these systems, in order to control and regulate processes. The process automation and instrumentation market in the oil and gas industry have started gaining heavily across the overall market. Increase in demand of automation is mainly attributed to the increased efficiency and reduced expenditure resulting from it; steps are taken to improve, and implement the required safety and security system in all the activities in the oil and gas industry. The process automation and instrumentation is used in all the activities in the oil and gas industry, which includes activities right from exploration & extraction, and transportation to its refining and marketing. Using automation and instrumentation products, the oil and gas companies can monitor and audit all their activities with a greater transparency. Due to the increasing demand of oil and gas, companies have had to explore more oil and gas wells, and most of these newly explored wells are located in deep sea or at a location that is considered as a harsh environment condition for humans. Implementing automation in these conditions facilitates the smooth flow of the production of oil and gas.

The process automation and instrumentation in the oil and gas industry deals with various products such as SCADA, DCS, PLC, MES, pressure transmitters, temperature transmitters, level transmitters, flow transmitters, liquid analyzers, gas analyzers and gas chromatographs, flow computers, and leakage detection system. These technologies facilitate the smooth flow of the oil and gas products, right from exploration till it reaches the end users.

The overall oil & gas industry activities are based on three operational activities, namely upstream, midstream, and downstream. Most of the automation is carried out with the aid of the downstream and upstream activities; these involve some of the most challenging and difficult processes, coupled with the exploration, extraction, and refining of oil and gas from harsh environmental conditions in order to make it a consumable product. Midstream activities focus majorly on the transportation of oil & gas; it requires ‘automation’ but lesser than the other two activities, in terms of the “value”.
The major driving factors for the process automation and instrumentation market, include—the rising demand of oil and gas, complicated exploration and extraction of ‘shale’ gas, upgradation of old oil and gas platform, rising demand of oil and gas, exploration of and extraction from aging oil and gas reservoirs, and the increasing emphasis on safety and security.

Some of the key players in this market (from the supply side) are ABB Ltd (Switzerland), Baker Hughes (U.S.), Emerson Process Management (U.S.), Honeywell Process Solutions (U.K.), Intech Process Automation Inc. (U.S.), Invensys Plc (U.K.), Rockwell Automation (U.S.), Yokogawa (Japan). Other key players in this market from demand side include various companies such as BP (U.K.), and Shell (Netherland).

| TABLE 1 |
| GLOBAL PROCESS AUTOMATION & INSTRUMENTATION MARKET VALUE IN OIL AND GAS INDUSTRY, BY TECHNOLOGY, 2013 - 2020 ($BILLION) |

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Source: MarketsandMarkets Analysis

The global process automation and instrumentation market in the oil and gas industry is, currently, at the growing stage; and is expected to grow from $XX billion that it is valued at,
currently, in 2013 to $XX billion in 2020, at a CAGR of XX% from 2013 to 2020. Process automation which includes SCADA, DCS, PLC and MES accounts for the majority of the market, accounting for around XX% of the total process automation and instrumentation market in oil and gas industry, currently, in 2013; and this segment is expected to grow at a CAGR of XX% from 2013 to 2020.

Middle East is leading the global process automation and instrumentation market of the oil & gas industry, owing to the high production of oil and gas in this region. Americas secure the second position due to the high oil production in this region; as well as the quick adoption trend for latest technology in almost every sector. Americas’ market is majorly driven by the North America region. High share of North America is mainly attributed to the fact that the U.S., recently, is almost at the top, in terms of the production of oil and gas, leaving behind Russia and Saudi Arabia. APAC region accounts for a small share, but it is growing continuously due to the high demand for oil & gas products, rapid industrialization, and continuous ongoing development in the Asian countries. Rest of the world includes some of the major countries in the oil & gas industry; such as Russia, and it also covers the emerging countries such as Azerbaijan, and Kazakhstan. A bright forecast has been estimated for these countries in the near future.
3 MARKET OVERVIEW

3.1 INTRODUCTION

Automation & instrumentation is the use of information technology and control systems (computers and set of devices) by replacing the human operator to control and regulate processes, robots, industrial machinery, and building environment. In today’s scenario, it is hard to imagine the process landscape in oil & gas industry without automation & instrumentation systems. Demand for automation & instrumentation in the oil & gas industry will continue to grow due to the increased requirements for providing high output quality, paired with high reliability in high volume production. It is difficult to achieve low cost and high quality outputs without automation & instrumentation, specifically, in the oil & gas industry.

3.2 MARKET DEFINITION

This report covers market insights of process automation and instrumentation market in the oil & gas industry. It includes detailed analysis of different products installed with regards to automation & instrumentation. Also, a geographical split across the globe is provided on the basis of major oil & gas— automation & instrumentation countries. The prominent players in different segments of the process automation and instrumentation market in the oil and gas industry have been recognized through secondary research and their market revenues were determined through primary and secondary research. The size of the overall market was derived by forecast techniques based on— the top-down and bottom-up approach, the study of the products and services areas, and the trends of various geographical regions.

- **Scope of the report:** This research report categorizes the global process automation and instrumentation market from the oil and gas industry on the basis of the technologies; various operation levels, which include upstream, midstream, and downstream; and also provides detailed geographical analysis, forecast revenue, market modeling, and evaluating trends in the market.
• **On the basis of ‘products’ of automation & instrumentation in the oil and gas market:** The process automation and instrumentation market in oil and gas is segmented by ‘products’ into automation, instrumentation, analyzer, flow computers, and leakage detection system. These categories are further divided into different automation & instrumentation products/technologies under them.

• **On the basis of ‘operations’:** Global process automation and instrumentation market in oil and gas is also segmented on the basis of ‘operation’, which includes the detailed analysis with regards to the implementation of products at various levels of operations.

• **On the basis of geography:** Americas, Middle East, Africa, Europe, APAC, and ROW are collectively covered in the report.

### 3.3 MARKET SEGMENTATION

Global process automation & instrumentation market in the oil & gas industry is broadly classified into three segments such as Technology, operational activity, and geography; wherein the technology segment is, further, segmented into automation, instrumentation, analyzer, flow computers, and leakage detection system. Process automation deals with the major technologies such as SCADA, DCS, PLC, and MES. On the other hand, process instrumentation includes pressure transmitters, temperature transmitters, level transmitters and flow transmitters; whereas the process analyzer segment includes liquid analyzer, gas analyzer, and gas chromatograph. Flow computers and leakage detection system are also included in the report.
SEGMENTATION OF PROCESS AUTOMATION & INSTRUMENTATION MARKET IN OIL & GAS INDUSTRY

Automation in Oil and Gas Classification Tree

- Products
  - Products 1
    - Products 1.1
    - Products 1.2
    - Products 1.3
  - Products 2
    - Products 2.1
    - Products 2.2
    - Products 2.3
    - Products 2.4
    - Products 2.5
  - Products 3
    - Products 3.1
    - Products 3.2
    - Products 3.3
  - Flow Computers
  - Products 4

- Operation
  - Operation 1
  - Operation 2
  - Downstream

- Geography
  - Geography 1
    - Geography 1.1
    - Geography 1.1.1
    - Geography 1.1.2
    - Geography 1.1.3
  - Geography 2
    - Geography 2.1
    - Others
  - Geography 3
    - Geography 3.1
    - Geography 3.2
    - Geography 3.3
    - Geography 3.4
    - Geography 3.5
  - Geography 4
  - Geography 5
  - Geography 6
    - Geography 6.1
    - Geography 6.2
    - Geography 6.3
  - Geography 7
    - Geography 7.1
    - Geography 7.2
    - Geography 7.3

Source: MarketsandMarkets Analysis
As shown in the above figure, the global market for oil & gas automation & instrumentation is also classified by operational activities such as upstream activities, midstream activities, and downstream activities.

**Geography:** On the basis of geography— the Americas, Middle East, Africa, APAC, and Rest of the World markets are covered extensively.

The above figure lists out the geographies covered under the process automation and instrumentation market in the oil and gas industry; in the geography segment of the market report.
3.4 HISTORY & EVOLUTION OF AUTOMATION & INSTRUMENTATION MARKET IN THE OIL & GAS INDUSTRY

The original DCS was developed in the 1970's by a team of engineers at Honeywell, and the first PLC was the brainchild of inventor Morley and others. Earlier, several innovative start-ups developed HMI software for PLCs and industrial I/O. The interesting stage of process automation and instrumentation started in 1980, where automation was restricted to some areas; such as the microprocessor, which had just entered into the market. Innovative sensors and actuators were brought forth by some key companies after a small period of time. With the passage of time, lots of technological changes came and integrated with each other, in order to create an organized process, which helped a lot in executing the process automatically, in less time and with a more accuracy. The key companies with respect to the process automation & instrumentation market in the oil and gas industry include Siemens (Germany), ABB (Switzerland), Emerson Process Management (U.S.), Rockwell Automation (U.S.), Schneider electric (France), Honeywell (U.S.), and others.
FIGURE 3

EVOLUTION OF GLOBAL PROCESS AUTOMATION & INSTRUMENTATION MARKET IN OIL & GAS INDUSTRY

Source: MarketsandMarkets Analysis
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