

Productivity-Collaboration and Integration of Functional Processes in Companies of the Oil and Gas Sector

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Abstract-Productivity Collaboration and Integration of Functional Processes in Companies in the Oil and Gas Sector, to develop and professionalize the "Collaboration Centers" to follow up and manage factors, scenarios, current and future operating conditions of the operation and its processes and workflows (exploration, exploitation design, reservoirs, drilling, completion, production, workover, surface facilities, construction, logistics, transport, maintenance, safety, occupational health and the environment).

Keywords- Productivity.

I. INTRODUCTION

This paper aims for the Oil and Gas and Gas Companies, through the Concept "Productivity Collaboration and Integration of Functional Processes in Companies in the Oil and Gas Sector", to develop and professionalize the "Collaboration Centers" to have elements that allow us to foresee.

follow up and manage factors, scenarios, current and future operating conditions of the operation and its processes and workflows (exploration, exploitation design, reservoirs, drilling, completion, production, workover, surface facilities, construction, logistics, transport, maintenance, safety, occupational health and the environment).

with reliability and mechanical integrity, operational discipline, physical security and other strategic processes to support and improve processes for the incorporation of reserves, exploitation, production, transportation and distribution of hydrocarbons through the integration of processes, workflows, procedures, standards, design and processing.

In collaborative environments of the organizational structure, personnel, tools/applications, and infrastructure of the Oil and Gas Companies. Through the application of the concept, the Oil and Gas Companies will continue to improve, optimize and streamline their operations, and safety strategies to reduce the time required in decision-making in the operation of incorporating reserves, exploitation, production, processing, transportation and distribution of hydrocarbons in the Oil and Gas Companies.

II. BACKGROUND

The Oil and Gas Companies are currently launching significant operational programs for the incorporation of

reserves, exploitation, and hydrocarbon production to supply the growing demand for Oil, Gas and Condensates.

Currently, Oil and Gas Companies are looking for opportunities that allow them to support, optimize and make decisions that lead to increased efficiency, effectiveness, operational reliability, physical security, reduction of non-productive times, unplanned problems and events as well as increasing the return on investment and meeting the organization's production commitments.

Derived from the current operating conditions, organizations have had to constantly adapt, recondition and modify the operating conditions and their operation and production infrastructure.

This has evolved according to the needs and behavior of the wells, fields and reservoirs. In accordance with the current situation of the oil and gas fields, where operational activity in the following years will continue intensively, it is clearly essential to optimize and streamline operations.

The high costs of operations, installations, infrastructure and equipment, the increasing complexity of incorporating reserves, extraction, hydrocarbon exploitation and production are critical factors that force optimizing, and, implementing appropriate technologies and methodologies, best operating practices, and integration processes in collaborative environments, will increase the chances of success in the investments of the Oil and Gas Companies. For many Oil and Gas Companies, it has become a great challenge, due to the complexity and the maturity of the oil and gas fields, the problem of decline in their production levels. Seeking to reverse this natural trend, extensive exploitation programs are being implemented, consequently generating a considerable increase in the volume of activities related to the incorporation of reserves, extraction, exploitation and

production of hydrocarbons; crucial activities within the production process of the.

Oil and Gas Companies require an optimization scheme, administration and integral collaboration, and a clear vision in the planning, monitoring and control through the implementation and application of collaborative environments and lessons learned that guarantee continuous improvement and the implementation of management strategies for each and every one of the operations to be carried out, in order to take advantage of the organization's opportunities (increased efficiency, reduction of costs and times) and through it, increased added value and profitability for Oil and Gas Companies.

To achieve the above, Oil and Gas Companies require professionalizing and implementing "Productivity Collaboration and Integration of Functional Processes", optimizing key and functional processes and workflows of operativity-exploration, exploitation design, reservoirs, drilling, completion, production, repairs, surface facilities, building, logistics, transport, maintenance, industrial security, occupational health, environment, reliability, operational discipline, mechanical integrity and physical security, as well as diagnose, apply optimal control and evaluation, efficiently, and quickly and proactively.

To the execution of own and third party activities, in order to make decisions that allow consolidating comprehensive plans, mitigate times and costs, optimize operational monitoring and control (plan vs. real), and all this together, to the preparation of personnel through the concept "Learning to Do" for the development of such functions, and in the management of comprehensive solutions based on collaborative environments to increase the sustainability and profitability of the business, and migration towards objectives that allow an Oil and Gas Company to become a World Class organization.

The implementation of the concept "Productivity Collaboration and Integration of Functional Processes" will allow Oil and Gas Companies to develop a fully integrated project, independent, and autonomous from any industrial interest, commercial, or service with third parties (operators, contractors and service providers with interests in projects of any type services or work) which will avoid any type of conflict of interest in the development of services or work. Likewise, the fact that the Oil and Gas Companies have Centers for "Productivity Collaboration and Integration of Functional Processes", will identify opportunities, optimal management, improvement of uncertainties, minimization of total costs, optimization of operations life cycle times, will improve profitability, risk reduction, and will allow closing the gap between what is planned and what is real, operating under the assets optimal conditions, working predictively and preventively (and not corrective or intuitive) to avoid operational problems,

incidents and economic losses with serious economic impact.

III. LOCATION

The place of execution of the works will be in:

- Offices and Work Centers of the Oil and Gas Companies, or where the service will be required or indicated.
- Offices and Work centers of this paper must have enough space and the electrical, communication and electronic equipment necessary for the proper development of the work.

IV. SCOPE OF THE CONCEPT

This concept will allow to analyze, diagnose, design, develop, professionalize, provide, implement and manage "Productivity Collaboration and Integration of Functional Processes" as dedicated centers for the consolidation of operations, optimization, reliability and security of resources and assets of the Oil and Gas Companies.

Integrated by a network of collaborative workspaces, works rooms, processes, workflows, standards, teams, infrastructure and multidisciplinary groups interconnected in collaborative environments, exchanging parameters with communication between work centers and their different functional disciplines of Oil and Gas Companies.

The Oil and Gas Companies must organize a formal team, committed to the change, innovative and experienced in implementing a strategic vision, to conduct the project in all its stages of diagnosis, planning, development, implementation, monitoring, analysis of results and feedback for the change.

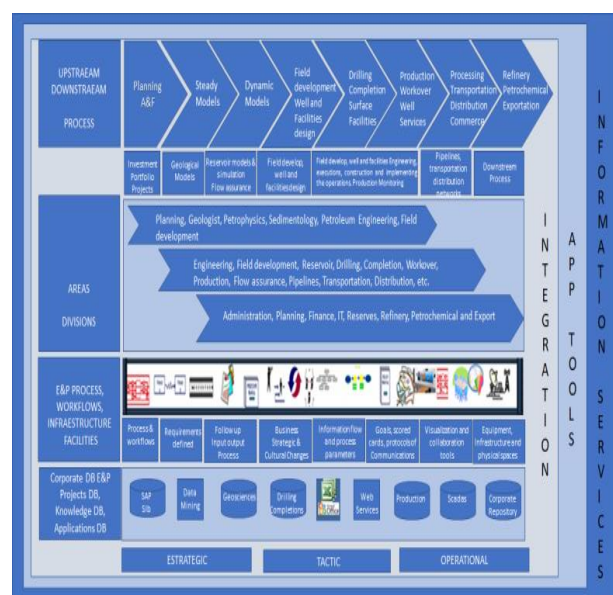


Fig 1. Organization Process.

The services required to provided and developed are detailed below:

1. Project Operational Link Service:

This paper will have an organizational structure throughout the project, guaranteeing its success, reducing risks, maximizing resources, and following up on:

- General work plan
- Plan for quality assurance
- Risk management plan
- Team integration plan
- Planning and standards for project monitoring

2. Definition of the strategy, site assessment and diagnostic:

- Identification of key personnel who will interact with the project, organization, and processes to provide knowledge and information
- Definition of mission, vision, values, objectives, general scope and project strategy
- Development of communication plans, process integration templates, workflows, and reporting formats
- Analysis and diagnosis of processes and workflows currently in operation
- Develop times, critical dates of the project and calendar commitments
- Identify areas or services with high economic impact, monitor, identify diversion factors and with this, focus on preventive, proactive and corrective actions
- Identify the costs of deviations and isolate them to know their fundamental causes, and know if they are due to special or common conditions, which will allow taking corrective actions and recovering those lost costs of opportunity

3. Gathering, organization and classification of infrastructure, information, workflows and parameters of the processes currently in operation:

Gathering, organization and classification of infrastructure information, workflows and parameters of the current processes of operation of all functional processes, reliability, operational discipline, mechanical integrity, physical security and other strategic processes for validation processes, analysis, design, modeling, implementation and generation of operation reports.

4. Validation of the infrastructure information, workflows and parameters of the processes currently in operation.

Gathering, organization and classification of infrastructure information, workflows and parameters of the current processes of operation of all functional processes, reliability, operational discipline, mechanical integrity, physical security and other strategic processes for analysis processes, design, modeling, implementation and generation of operation reports.

5. Detailed design and engineering:

Operativity

- Integrated well planning and execution process
- Integrated process of planning and execution of wells in drilling, completion, repair, information and service stages
- Integrated process well stability maps
- Integrated process of wellbore schematics
- Integrated process of well productivity
- Integrated process of operational programs and portfolio of opportunities
- Integrated process of the gas lift network
- Process integrated into the operations of the reservoirs
- Integrated pipeline process, transport and distribution network
- Integrated hydrocarbon measurement and dehydration process
- Other strategic operational processes
- Operational reliability and integrity of facilities and infrastructure
- Physical security management of facilities, infrastructure and vehicle fleet

6. Analysis, design, development, optimization and implementation of integrated processes and workflows of operability, reliability and integrity, physical security and other strategic processes:

- Development, mapping and description
- Descriptive development for the integration and optimization of processes
- Models of behavioral observance
- Analysis-based models for generating optimization opportunities in integrated processes and workflows
- Incorporation and integration of an analysis-based model for supervision and monitoring in optimizing processes and workflows in each of the operational areas and a multidisciplinary working group to increase analysis to identify strategic decisions
- Definition of the members of the work team
- Processes and workflows, work schedules and relationships between the functions of the organization
- Design and configuration of the facilities
- Identification of applications and tools for the proper implementation of processes and workflows
- Development and generation of the interpretation of the proposed facilities design, configurations and technical specifications (including the equipment list) required for implementation
- Identification of key performance indicators, to measure the efficiency, effectiveness and optimization required for each process and workflow
- Development of the change management implementation strategy.

7. Plan implementation and estimated program of each collaborative room (per room) must be developed by managing a complex integration project to define, develop, test, train and install the solution on multiple dimensions

Organization and development of an integrated detailed implementation plan that includes all process, organizational, and technical changes that will be addressed during implementation, identifying the resources required to execute the implementations, highlighting risks, resource gaps, and key dependencies.

Also, it has to be considered:

- Change management plan
- Mobilization plan.
- Procurement and development plan
- Estimated preliminary test and implementation plan

Dimensional visualization, operability monitoring rooms, reliability and integrity, physical security management, technical limits, optimization, security protocols and other processes, as well as its data network, meeting rooms, rest room and room storage.

Physical implementation of the components of each collaborative room, developed and managing the integration project and defining, installing, testing and implementing the solution on multiple dimensions including physical environment.

Follow-up, monitoring and reporting for the operational processes, reliability and integrity, physical security management, vehicle fleet and maintenance, technical, strategic limits, optimization, security protocols and others. Analysis and decision-making forums in collaborative environments.

V. SPECIFICATIONS FOR THE IMPLEMENTATION

The execution of the works will be carried out according to the specifications indicated below:

DESCRIPTION
Part 1: Principles for design of control centers
Part 2: Principles for the arrangement of control suites
Part 3: Control room layout
Part 4: Workstation layout and dimensions
Part 5: Human-system interfaces
Part 6: Environmental requirements for control rooms
Part 7: Principles for the evaluation of control centers
Part 8: Ergonomic requirements for specific applications

VI. CONCLUSIONS

The Oil and Gas Companies, if decide to implement the Concept of this paper will obtain the following benefits: Have a comprehensive process for the diagnosis, design, redesign, reorganization, optimization, implementation and monitoring that provides support for operations control through the collaboration excellence and operations centers.

Identify processes, key workflows, functional and organizational structures, functional dimensions and associated applications to be carried out in the field and cabinet related operation (operativity-exploration, exploitation design, reservoirs, drilling, termination, production, repairs, surface installations, construction, logistics, transport, maintenance, industrial security, occupational health and environment), reliability, operational discipline, mechanical integrity and physical security.

Take advantage of the collective and interrelated knowledge of the organization through the creation of collective environments and the knowledge base to document and preserve the knowledge of the organization and best operational practices. Implementation that complies with the business plan and resource development of the Oil and Gas Companies.

Generate a clear vision of the operation, guaranteeing continuous improvement and the implementation of operational strategies in each of the activities to be carried out, in order to detect the areas of opportunity for the administration of assets of the Oil and Gas Companies:

- Increase the operational and collaborative efficiency of the multidisciplinary groups of the Oil and Gas Companies and their respective processes
- Reduce costs and time, raising the economic value that allows maintaining, stabilizing and/or increasing the incorporation of reserves, hydrocarbon exploitation and production programs
- Contribute to increase the profitability of Assets and their investments and therefore of the Organization
- Contributions and support for changes necessary to optimize the asset development and management capabilities of Oil and Gas Companies, as well as:

Implementation of:

- Operations standards and methodologies.
- Processes and flows to operate the collaboration and control center
- Parameters and technical limits for controlling operating conditions
- Optimization of decision-making in a timely and efficient manner

- Optimize and maximize the value of the assets of the Oil and Gas Companies (personnel, wells and infrastructure, reserves and hydrocarbon production) that leads to obtaining a strategic and economic impact for the Oil and Gas Companies

Operate under desirable and safe conditions

- Development and implementation of industry practical and standard improvements for collaboration centers in the oil industry
- Standardization and implementation of reliable Oil and Gas standards of operations

Implementation of processes to achieve referential results of the centers for integrated collaboration of assets:

Improvement of hydrocarbon recovery	3% 15%
Acceleration of hydrocarbon production	4%-9%
Reduction of inactive, unproductive times (differentiated production)	2%-6%
Improving efficiency in intervention programs (workovers)	3%-25%
Reduction of intervention costs wells	5%-15%
Reduction of the decline and slowdown of hydrocarbon production	3.5%-12%
Production acceleration	4%-18%
Reduction of inactive, unproductive times (deferred production)	5%-10%
Reduction of unproductive times by improvement of efficiency in intervention programs (repairs) and effectiveness of successful wells.	8%-10%
Optimization of the frequencies of the operations of interventions and maintenance of wells	10%-30%
Increase in the productive active time of facilities and assets	15% - 30%
Reduction and optimization of input costs (production operations)	13% - 25%
Reduction of unplanned events	20%-30%

Determine the operational programs, preventive, proactive actions and their corrective cases based on the optimal and timely results of the collaboration centers. Time detection of problems caused by current operating and production conditions, which can cause personal damage, material damage, spills, environmental contamination, decreased production and deferred production through the timely redefinition of operating strategies.

Safer operation given that the operators will have the information through the integration of collaborative environments, which will allow all multidisciplinary teams, from all locations, to have a more comprehensive and collective common knowledge of operations.

Transfer of the use of the concept which implicitly entails the transfer of knowledge to the personnel of the Oil and Gas Companies, since the operation engineers, specialists and technicians will participate directly in the development and results of the services, as well as in the management, operation and administration of the collaboration centers. Alignment of the business plans to international standards, processes and best practices.

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