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Continual improvements brought about by QHSE Management System in Geophysical Field Parties

H.N. Garg, K.S. Rao+*

Summary

The Geophysical Field Parties are accredited with ISO 9001:2000, ISO 14001:2004 and OHSAS 18001:2007. The first time accreditation was awarded in the year 2005 for three years. In June 2008 all the field parties were reaccredited for further three years. During the five years of ISO certification parties have continually improved in three areas of quality, environment and occupational health and safety by setting objectives and targets and achieving them on yearly basis.

The desire to excel and improve was imbibed by implementation of Quality, Health, Safety and Environment Management System (QHSE MS) as each individual has to participate in brainstorming sessions where the areas for improvements are discussed.

The implementation of the QHSE MS has changed the working style of party. The quality of the work, adoption of safe working practices to protect and improve environment and emphasis on occupational health and individual safety has given a new lease of life and sense of satisfaction to customers, employees, contractual workers and even visitors.

1. Introduction

The Quality Management System – ISO 9001:2000 issued by the International Organization for Standardization (ISO) was adopted by Bureau of Indian Standards and it is also termed as Indian Standard (Second edition).

Adoption of Quality Management System – ISO 9001:2000 means that the Geophysical Field Parties should demonstrate a) their ability to consistently provide seismic data that meets customer and applicable regulatory requirements, b) to enhance customer satisfaction through the effective application of the system, including processes for continual improvement.

Environment Management System – ISO 14001:2004 helps in achieving and demonstrating sound environmental performance by controlling the impacts of activities of geophysical parties on the environment, consistent with the environmental policy and objectives of ONGC. This is being done in context of increasingly stringent legislation, the development of economic policies and other measures that foster environmental protection and sustainable development.

The Occupational Health and Safety Assessment Standard OHSAS – 18001:2007 give requirements for an Occupational Health and Safety (OH&S) management system to enable geophysical field parties to control its OH&S risks and improve its performance.

To boost up the investors, customers and public confidence and to bring continual improvement in the activities of all 27 Geophysical field parties of ONGC the QHSE management system was designed and implemented in the year 2005.

The line approach was changed to a "process approach". Process is a set of activities which can be managed to transform inputs into outputs by using resources. Often the output from one process becomes the input of the next. The identification, application of a system of processes and their interactions and management in the geophysical field party can be referred as "process approach" (fig 1).

** Geophysical Services, Western Onshore, ONGC, Vadodara, Gujarat, India. garg_hn2006@yahoo.com*

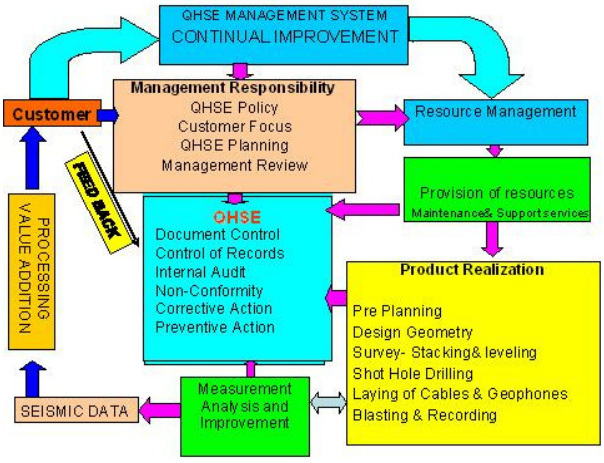


Fig 1 Integration of Process based model and QHSE MS of a Geophysical field Party

2. Methodology

Continual improvements in working of geophysical field parties were brought about by applying methodology of PDCA (Plan-Do-Check-Act) on all processes. PDCA (fig 2) can be briefly described as follows:

Plan: Establishes the objectives and processes necessary to deliver results in accordance with customer requirements and the field party's policies.
Do: Implementation of the processes.
Check: Monitors and measures the processes and product against policies, objectives and requirements and result is reported.
Act: Actions are taken to continually improve process performance.

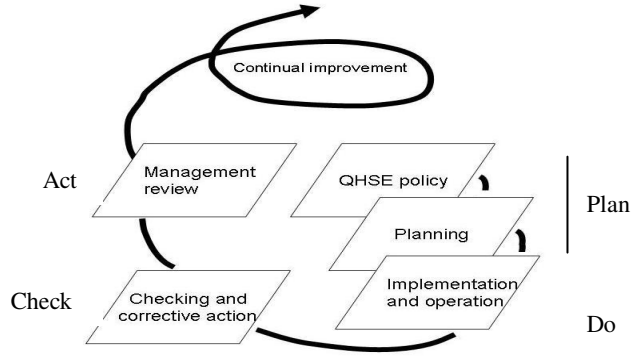


Fig 2 PDCA Approach for continual improvement

The macro process diagram of a seismic geophysical field party is shown in the fig 3.

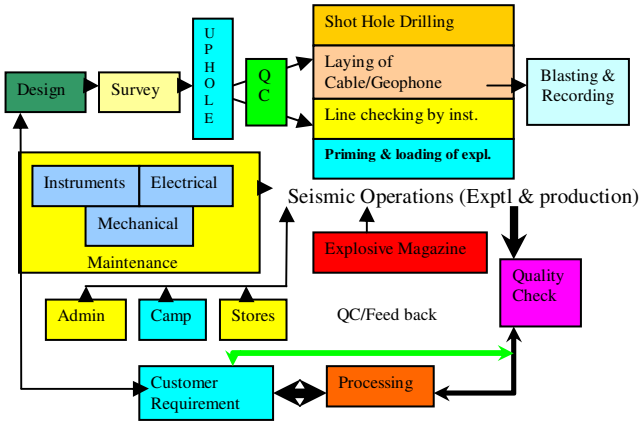
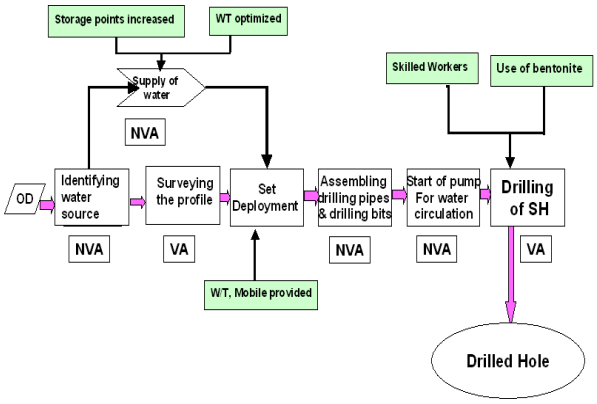


Fig 3: Process flow diagram of a geophysical Party (GP).

Based on the above diagram the micro process diagram of each sub processes are drawn and then an effort has been made to improve the processes. The improved process diagrams of the process shot hole drilling and Field Layout are shown in fig 4 and fig 5.



OD – Optimum depth; NVA – Non value added ; VA – Value added; W/T – Water tanker; SH – Shot hole

Fig 4: Improved Process diagram of the process "Shot hole drilling

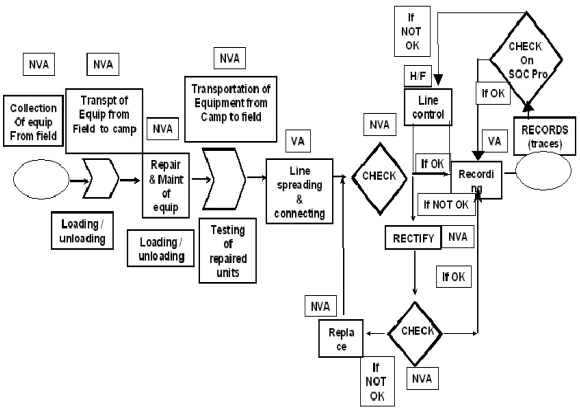


Fig 5: Improved Process diagram of the process "Field Layout"

2.1. PDCA approach on Quality Management System:

The policy of field parties are to enhance customer satisfaction by providing quality seismic data at par with international standard and to continually improve its Quality management system by reviewing periodically its policy and objectives and adhering to applicable and other legal requirements.

Monitoring of customer satisfaction requires the evaluation of information relating to customer perception as to whether the field party has met the customer requirements.

The model shown in figure 6 covers all the requirements of the International Standard, but does not show processes at a detailed level.

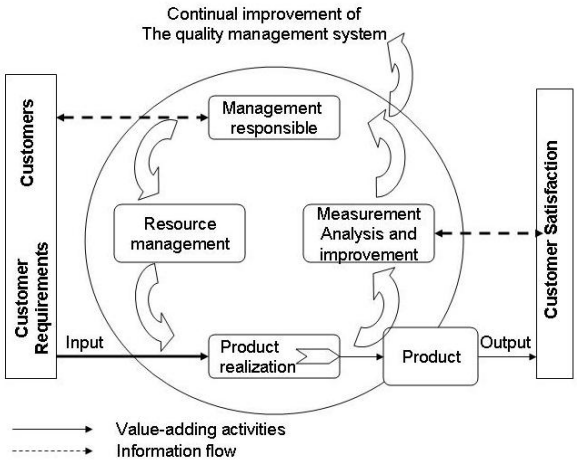


Fig 6: Model of a process based quality management system

For reserve accretion the first and vital phase of exploration is acquisition of seismic data. The quality norms are made stringent to map the structural and stratigraphic features of the mother earth. The objectives and targets of Quality Management system have been fixed. A responsibility matrix for the same is given in table 1.

Table 1: Objectives and targets of QMS

Objectives	Targets	Primary responsibility (PR)	Secondary Responsible (SR)
Maximize seismic production	As per the performance contract signed.	HGS	Party Chief
Maintain the quality of seismic data as per the performance contract.	1. Monitor all the parameters regularly and by adhering to daily checklist and QC checks. 2. Optimization of Field & Instrument Parameters. 3. Frequency analysis for maintaining desired quality.	HGS / I/C Operations	Party Chief
Seismograph availability	98 % system availability	I/C, REL	Party Chief
Ground Electronics	95 % Individual component to make 98% system availability	I/C REL	Party Chief
Maintain the quality of Topographical survey	Accuracies as per section 3.2 of LMSDA	I/C Survey	Party Chief
Make all the material and services available	All the indents sent to the materials management department and to procure within the approved norm time.	HGS	Head MAP/ MM

95%field parties achieve their physical and quality targets.

2D work 3D work

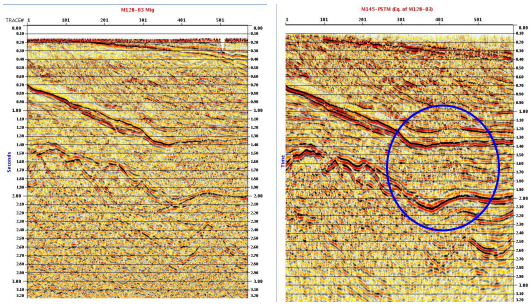


Fig 7: Improvement in data quality of area 'A'

The data quality has improved in area 'A' by use of state of art technology instrument (fig 7). The data quality has also improved significantly in 3D survey during f.s. 2007-08 by use of new vibrators and optimal parameters over the f.s. 2003-04 in area 'B' (fig. 8).

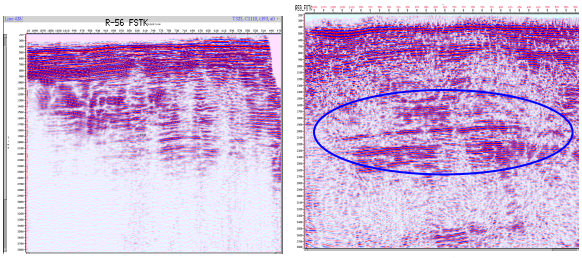


Fig 8: Improvement in data quality of area 'B'

2.2. PDCA approach on Environment Management System:

The policy of field party is to maintain highest standards of environment protection and prevent damage to environment. To equip employees and contractors with the awareness, information, instructions, and supervision skills needed for environmental management. To continually improve its "Environment" management system by reviewing periodically its policy and objectives and adhering to applicable and other legal requirements.

The objective of minimizing spillage of POL has been achieved and now there is no spillage in the field party. This agenda has now been dropped from objective and target list. A new agenda of minimizing electrical consumption has been taken up.

The following objectives have been fixed at various levels. A responsibility matrix is given below:

Table 2: Objectives and targets of EMS

S N	Objective	Targets	PR	SR
1	Reducing electricity consumption	1% reduction in consumption of electricity	P & A	Party Chief
2	Greening of surroundings .	1. One small garden inside the camp 2. 10 trees samplings should be planted protected and looked after during the field season outside the camp premises.	Party Chief	MR

The aspect and impact of all activities affecting environment have been listed and high impact activities are controlled by PME, management programmes. The greening of surrounding has been increased (fig 9) and beautiful gardens are maintained in the camp premises (fig 10).

Fig 9: Tree plantation around camp area of a GP

Fig 10: Gardens and beatification in camp of a GP

2.3. PDCA approach on OH & S System:

The policy of field party is to

1) Maintain highest standards of occupational health and safety ensure safe operations, prevent loss of property. To protect employees, contractual persons and persons living in adjacent areas of the geophysical party from the foreseeable work hazards.
2) Be always alert and equipped to respond to emergencies and disasters by having an updated

emergency response plan and disaster management plan.

3) Equip employees and contractors with the awareness, information, instructions, and supervision skills needed for safe working.
4) Continually improve its "Occupational health" and "Safety" (OH&S) management system by reviewing periodically its policy and objectives and adhering to applicable and other legal requirements.

The following objectives have been fixed at various levels. A responsibility matrix is given below (table 3):

Table 3: Objectives and targets of OH & S MS

S	Objectives	Targets	PR	SR
1	Accident free operation during storage, transportation and use of Explosive.	Zero accidents	Field crew	Party Chief
2	To protect work force from hearing loss.	No person should be affected by hearing loss.	Field crew	Safety officer
3	To protect work force from electrical shock	Zero percentage of people affected by electrical shock	I/C maintenance	Safety officer
4	To protect work force from back bone problems	No person should be affected by back bone problems	I/C store MM	Safety officer

Various counseling sessions for workers have been arranged at camp site and workers camp site to brief workers about QHSE aspects of work.

As a result of implementation of OH & S MS Periodical Medical Examination (PME) of all employees were made compulsory. The health awareness and precautionary measures have led to improved fitness of employees for field work. Listing of near miss and the corrective and preventive actions have reduced the chances of accidents in field parties.

3. Conclusions:

The implementation of Integrated QHSE management system in geophysical field parties has improved the data quality. The approved quality manual - Land and Marine Seismic Data Acquisition (LAMSDA) is followed. Each party is getting monthly feedback from quality control group. Internal audit and Management Review meetings are done every six months. The observations and non conformity are being resolved. Customer's representative is involved at all levels of decision making and evaluation of data. Corrective and preventive measures are taken as and when required. The activities and camp lay out of all parties are standardized. A sea change has been brought about in the attitude of party personnel towards health and safety. The journey management, mock fire drill, emergency response plans, disaster management plans have added extra safety measures in all operations of the parties. The parties are not polluting air, water and soil. The environment is conserved by plantation of trees and use of optimal energy.

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* Geophysical Services, Western Onshore, ONGC, Vadodara, Gujarat, India. garg_hn2006@yahoo.com
+ Geophysical Services, Western Onshore, ONGC, Vadodara, Gujarat, India. ksr10861@gmail.com