CNOOC Limited

CNOOC HSE Management Practice

Willis Asia Energy Conference
January 28-29, 2014  Haikou
Content

1. About CNOOC
2. Risks & Challenges
3. HSE Management Practice
4. International HSE Practice
About CNOOC

- Headquater in Beijing
- Largest producer of offshore crude oil and natural gas in China
- One of independent oil and gas exploration and production companies in the world
- HSE Systematic Management
- Zero Significant Incident
- Zero minor oil spill Incident
Key Operating Areas

21 countries in 6 regions
CNOOC Ltd. in 21 countries

<table>
<thead>
<tr>
<th></th>
<th>CNOOC Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Indonesia</td>
</tr>
<tr>
<td>A2</td>
<td>Gabon</td>
</tr>
<tr>
<td>A3</td>
<td>Kampuchea</td>
</tr>
<tr>
<td>A4</td>
<td>Burma</td>
</tr>
<tr>
<td>A5</td>
<td>Nigeria</td>
</tr>
<tr>
<td>A6</td>
<td>Equatorial Guinea</td>
</tr>
<tr>
<td>A7</td>
<td>Congo (Brazzaville)</td>
</tr>
<tr>
<td>A8</td>
<td>Algeria</td>
</tr>
<tr>
<td>A9</td>
<td>Australia</td>
</tr>
<tr>
<td>A10</td>
<td>Canada</td>
</tr>
<tr>
<td>A11</td>
<td>Trinidad and Tobago</td>
</tr>
<tr>
<td>A12</td>
<td>Papua New Guinea</td>
</tr>
<tr>
<td>A13</td>
<td>United States</td>
</tr>
<tr>
<td>A14</td>
<td>Argentina</td>
</tr>
<tr>
<td>A15</td>
<td>Qatar</td>
</tr>
<tr>
<td>A16</td>
<td>Iraq</td>
</tr>
<tr>
<td>A17</td>
<td>Uganda</td>
</tr>
<tr>
<td>A18</td>
<td>Gulf of Mexico</td>
</tr>
<tr>
<td>A19</td>
<td>Columbia</td>
</tr>
<tr>
<td>A20</td>
<td>Yemen</td>
</tr>
<tr>
<td>A21</td>
<td>UK</td>
</tr>
</tbody>
</table>
About CNOOC

Risks and Challenges

HSE Management Practice

International HSE Practice
Threats to Global Upstream Industry

Note 1: Communications Committee is key to managing all risks through effective stakeholder communication
Note 2: All risks are theoretical scenarios for planning purposes
Risks & Challenges to CNOOC

DRILLING

ENGINEERING

PRODUCTION

HELCICOPER

LNG

OIL TANK
Risks & Challenge to CNOOC

- Severe Weather
- Government Approval
- Environmental Impact
- Service Resources
Risks & Challenge to CNOOC
Regulatory Change in China

- **Work Safety Law** - effective from December 01, 2014

- **Environmental Protection Law** – Effective from January 1\(^{st}\), 2015
Content

1. Company Overview
2. Risks and Challenges
3. HSE Management Practice
4. International HSE Practice
CNOOC HSE Philosophy

- Sound HSE performance is one of the foundations for the company’s growth and development
- Ensuring economic return, HSE management is also our commitment to social responsibility
- Put people first and regard employees as our most valuable resource and asset
- With set objectives, implementation is important
- Conduct systematic management and continuous improvement with the motto “We can always do it better”
- Promote the “5 DON’Ts until Dos” safety rules, focus on details, manage risks to an acceptable level
- Manage contractors and share information and experience to achieve Win-Win cooperation
- Endeavor to use clean and harmless materials and energy, and protect environment and natural resources
- Comply with laws, regulations and industrial standards, and strive for HSE excellence
- HSE performance mirrors the comprehensive quality of the company
Message from CEO

● Nothing is important if we cannot provide a safe work environment;
● People are most valuable to us and to their family;
● Everyone is supported to STOP WORK if you feel any unsafe condition at work;
● HSE is one of the foundation of a company’s operation

Dear Colleagues,

When you open this handbook, whether as an employee or contractor, you are most valuable to us and to your family. Please make sure all work is performed safely and without harm to the health of the people or environment and property. Nothing is important if we cannot provide a safe work environment.

I hope everyone keeps “5 DON'Ts until DOs” in their mind at all times during their work. Always remember that everyone is supported to STOP WORK immediately if they feel any work situation to be unsafe.

Health, safety and environmental protection are critical components of our corporate culture. The Company is dedicated to pursuing the harmonious synergy between corporation and society as well as between humans and nature. As a responsible company, we will continue to maintain our transparency and high standard of corporate governance with the intention to make timely disclosures and to accept public scrutiny with humility.

HSE is one of the foundations of the Company’s operation. Over the years, and with great diligence, we have achieved an outstanding track record in the areas of safety and environmental protection. However, great challenges lie ahead. We will continue working together to create a better tomorrow. Only with your support and contribution can we fulfill this commitment.

Li Fan Rong
Chief Executive Officer
HSE Management System
Development Overview

- **UK HSE**: Lord Cullen's 1990 report *The Offshore Installations (Safety Case) Regulations*
- **IMO**: 1993, *ISM CODE International Safety Management Regulations*
- **SA(Australilia)**: *Construction OHSR Management System*
- **API RP 750**: *Management of Process Hazards*
- **BSI（UK）**: BS8800, 1996, *OH&S Management Safety Guidelines*
- **USA**: AIHA OHSMS, 1996 *OHS Management System*
- **ISO14000 1996.10**: Environment Management System
- **ISO Conference**: Jan. 1997, Postphone to publish OHSMS
- **OHSAS 18001:1999**: Occupational Health and Safety Management System—Specification (OHSMS)
CNOOC QHSE General Requirement

International HSE Standard & guideline

Regulators requirement

ISO9001, ISO14001, OHSAS18001, ISO29001, ISO31000, etc.

IOC QHSEMS Best Practice
Continuous Improvement

PLAN
Do

Continuous Improvement

Act
CHECK
Key Elements in CNOOC HSEMS

01 QHSE Risk Management
02 Regulations & Standards
03 HSE Target & Key HSE
04 QHSE Roles & Responsibility
05 QHSE Training & Certifications
06 QHSE Communication
07 HSE Systematic Management & Continuous Improvement Plan
08 QHSE Documentation Control
09 Project QHSE Management
10 HSE Duty Diligence
11 Contractor QHSE Management
12 Oversea QHSE Management
13 Safety Management
14 Health Management
15 Environment Management
16 Quality Management
17 Climate Change & Sustainable Development
18 Emergency Management
19 Incident Management
20 QHSE Management Review & Audit
HSEMS Compliance with the Laws

1. Accountabilities & Responsibilities
2. Policies & Systems
3. Education & Training
4. HSE Investment
5. Inspection & Hazard Control
6. Emergency Management
7. Incident Management
8. Contractor Management
9. Environment Management
Company Rules, Standards & Procedures meets the Laws requirement

<table>
<thead>
<tr>
<th>Year</th>
<th>Document Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>中国海洋石油总公司重大安全环境污染责任事故行政责任追究的规定（试行）</td>
</tr>
<tr>
<td>2006</td>
<td>中国海洋石油总公司承包商健康安全环保管理规定</td>
</tr>
<tr>
<td>2007</td>
<td>中国海洋石油总公司危机管理预案（2007版）</td>
</tr>
<tr>
<td>2008</td>
<td>确认总公司安全生产委员会组成</td>
</tr>
<tr>
<td>2009</td>
<td>环保遗留问题挂牌督办及安全隐患整改跟踪的通知</td>
</tr>
<tr>
<td>2010</td>
<td>总公司管道及生产储存场所安全距离不足问题统计结果</td>
</tr>
<tr>
<td>2011</td>
<td>中国海洋石油总公司危机管理预案（2010版）</td>
</tr>
<tr>
<td>2012</td>
<td>全面开展安全生产标准化工作的通知</td>
</tr>
<tr>
<td>2013</td>
<td>强化全员安全培训工作的通知</td>
</tr>
<tr>
<td>2014</td>
<td>中国海油承包商文明安全行为指南</td>
</tr>
<tr>
<td>2015</td>
<td>中国海油施工现场HSE管理要求</td>
</tr>
</tbody>
</table>
Training & Competence

- Leadership HSE Training
- Internal Safety Supervisor Certification Training
- National Register Safety Engineer Management
- Environment Professional Training
- Offshore Staff 5-competence Training
- HSE Induction
- Onsite HSE Training
- External NIEBOSH Training
Safety Training before Going Offshore

- Basic offshore safety training
  - Fire fighting
  - Lifeboat/raft operation
  - Survival at sea
  - First aid
  - Helicopter underwater escape training
Professional Training Centre

Safety Training Centre

HUET

Fire Drills

Special Operation Training
### Training Courses Conducted in 2014

<table>
<thead>
<tr>
<th>序号</th>
<th>培训名称</th>
<th>期数</th>
<th>参培对象</th>
<th>培训人数</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>海洋石油安全生产资格证培训</td>
<td>13</td>
<td>上游</td>
<td>1527</td>
</tr>
<tr>
<td>2</td>
<td>中下游企业领导与HSE人员培训</td>
<td>2</td>
<td>中下游</td>
<td>187</td>
</tr>
<tr>
<td>3</td>
<td>英国国家职业安全卫生等级考试中心（NEBOSH）培训</td>
<td>1</td>
<td>机关</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>英国海洋石油监管培训</td>
<td>1</td>
<td>上游</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>应急指挥系统 (ICS) 培训</td>
<td>1</td>
<td>全公司范围</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>机关人员钻井与油气生产知识培训</td>
<td>3</td>
<td>机关人员</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>危险与可操作性分析（HAZOP）引导员培训</td>
<td>2</td>
<td>中下游</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>QHSE体系审核员培训</td>
<td>1</td>
<td>全公司范围</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>职业健康管理人员职业卫生专业技能提升培训</td>
<td>1</td>
<td>全公司范围</td>
<td>107</td>
</tr>
<tr>
<td>10</td>
<td>“预防噪声聋-制定听力保护计划”培训</td>
<td>1</td>
<td>全公司范围</td>
<td>40</td>
</tr>
<tr>
<td>11</td>
<td>国内油气防恐培训</td>
<td>1</td>
<td>全公司范围</td>
<td>61</td>
</tr>
<tr>
<td>12</td>
<td>储罐安全知识培训</td>
<td>1</td>
<td>全公司范围</td>
<td>70</td>
</tr>
<tr>
<td>13</td>
<td>环保经理、主管培训</td>
<td>1</td>
<td>全公司范围</td>
<td>102</td>
</tr>
<tr>
<td>14</td>
<td>QHSE内训师培训</td>
<td>4</td>
<td>全公司范围</td>
<td>107</td>
</tr>
<tr>
<td>15</td>
<td>安全监督考核</td>
<td>4</td>
<td>全公司范围</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td><strong>合计</strong></td>
<td>37</td>
<td></td>
<td>2473</td>
</tr>
<tr>
<td>年份</td>
<td>事件</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001年</td>
<td>发布《合同中的HSE条款》</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005年</td>
<td>编制《承包商管理指南》</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006年</td>
<td>发布《承包商健康安全环保管理规定》</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011年</td>
<td>修订《承包商管理指南》，作为央企安全生产工作会材料</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012年</td>
<td>开发承包商管理系统，规范六大管理流程</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013年</td>
<td>建立潜水承包商准入制度。</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014年</td>
<td>发布《承包商作业文明安全行为指南》</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014年</td>
<td>发布《承包商安全环保责任事故积分管理办法》</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Contractor HSE Management

- Planning
- HSE Capabilities Assessment
- Tender and Award
- Pre-mobilization
- Execution
- De-mobilization
- Final Evaluation and Closeout
Contractor In-house Training Center
Contractors HSE Management System

1. Project Work Scopes
2. Project Risk Assessment
3. Tender and Award
4. Premobilization
5. Execution
6. Demobilization
7. Final Evaluation and Closeout
Environment Management

- Compliance
- Oil Spill Prevention
- Oil Spill Response
Lifecycle Environmental Management
OIL SPILL RESPONSE BASE

- 7 bases in Completion
- 7 bases in planning

- 绥中基地
- 塘沽基地
- 龙口基地
- 上海基地
- 舟山基地
- 福建基地
- 深圳基地
- 珠海基地
- 惠州基地
- 涠州岛基地
- 文昌基地
- 东方基地
Oil Spill Response Support
CNOOC EMS STRUCTURE

- HQ ECC
- Branch ECC
- Site ERT

- Crisis Management Plan (CMP)
- Emergency Response Plan (ERP)
- Emergency Action Plan (EAP)

- Worksite ERT
- Vessels & Helicopters
- Emergency Maintenance Team
- Professional Oil Spill Response Team

- 3D ER Information Display system
- Major Hazards Management System
- Facilities Emergency Database system
- POB Tracking System
- Real-time Dynamic Vessel Tracking System
- Oil Spill Monitoring Tracking System
- On-spot CCTV Monitoring System
- Emergency Video Conference
- Adverse Weather Alert System
- ...
3 Tiers of Emergency Commanding Center

- **3 Tiers of**
  - HQ ECC
  - Regional/branches ECC
  - Worksite ERT

- **Government ER Ministries**
  - 国家海洋局应急办公室
  - 环境保护部应急值班室
  - 国务院应急办公室
  - 国资委应急值班室
  - 国家安监总局安全生产应急救援指挥中心
  - 交通部海上搜救中心

- **3 Tiers of**
  - 中国海洋石油总公司应急指挥中心
  - 上海分公司应急指挥中心
  - 天津分公司应急指挥中心
  - 油气利用公司应急指挥中心
  - 绥中36-1油田
  - 渤南油田
  - 本地ECC
Emergency Rescue Teams

- Fire Fighting
  - Full time Team
  - Part-time Team
- Dangerous Good
  - Dangerous Good Emergency Rescue Team
- Oil Spill
  - COHS (Professional oil spill Recovery)
- Pipeline
  - Pipeline Emergency Maintenance Center
- Man Rescue
  - Medical Treatment
## Emergency Drill & Training

<table>
<thead>
<tr>
<th>Type of Drills</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Drill</td>
<td>Every Work shift or weekly</td>
</tr>
<tr>
<td>Abandon Drill</td>
<td></td>
</tr>
<tr>
<td>Well Control Drill</td>
<td>Every Work shift or weekly</td>
</tr>
<tr>
<td>Man Overboard Drill</td>
<td>Once every season</td>
</tr>
<tr>
<td>Oil Spill Response</td>
<td>Once a year</td>
</tr>
<tr>
<td>H2S Drill</td>
<td></td>
</tr>
<tr>
<td>Toxic Gas Release</td>
<td>Depending on work schedule and plan</td>
</tr>
<tr>
<td>Confine Space Rescue</td>
<td></td>
</tr>
<tr>
<td>First Aid/Medical Treatment</td>
<td></td>
</tr>
<tr>
<td>Typhoon Evacuation</td>
<td></td>
</tr>
<tr>
<td>…</td>
<td></td>
</tr>
</tbody>
</table>
Drills in 2014

- Total drills: 19068
- Complex Drills: 2067
- Specified Drills: 17001
- Participants: 465806
Incident Management

- Government Reporting Requirement
- OGP Safety Data Requirement
- Company Incident Management Requirement
- Company Incident Reporting Guidelines
- Company Incident Investigation Procedures
Level of Incidents

Incident grade

A
- Three or more fatalities
- Ten or more heavy injury
- 10 million RMB property lost
- Spill more than 10 t

B
- One or two fatalities
- 3 to 9 heavy injury
- 1 to 10 million property RMB lost
- Spill 1 to 10 t

C
- LTA less than B
- 0.1 to 1 million RMB property lost
- Spill 0.1 to 1 t

D
- No LTA
- Less than 0.1 million RMB property lost
- Spill less than 0.1 t

E
- MTA less than D
- 10K RMB property lost
2013 OGP TRIR statistics

*The Statistic is from the “OGP-Safety performance indicators-2013”, The Company code of CNOOC Ltd is JJ, the Static is not include the Nexen.
Management Review & Audit

- Governmental Required HSE Inspection
- HSEMS Audit
- HSE Special Inspection
- Contractor HSE Review
- Oversea Project HSE Inspection
- Annual HSE Management Review
HSE Management e-Tools Infrastructures

**GENERAL**
- Regulations & Standards Database
- Offshore POB Tracking System
- QHSE Training Management System
- Sustainable Development Management System
- Safe Operation Standardization System
- Contractor QHSE Management System

**HEALTH**
- OH Management System
- Employee Health Management System

**SAFETY**
- Major hazards Management System
- Offshore POB Tracking System
- Incident Management System
- Safety Simultaneous Management System

**ENVIRONMENT**
- Oil Spill Tracking System
- Environment Management System
- Vessel Dynamic Tracing System
- Safety Simultaneous Management System

**EMERGENCY**
- 3Dynamic Emergency Information Management System
- Adverse Weather Alert System
- Facility Emergency Database
- Dangerous Good Vehicle Tracking System
- Personnel Positioning Tracking System
- Worksite CCTV Transmission System
- CNOOC Global Emergency Response Resources Management System

**QUALITY**
- Quality Management System
Major Hazards Management Systems

- Hazard & Risk Control
- Hazard Source Information
- Emergency & Information
- Statistical Analysis

- Hazard Source & Risk Control
  - Hazard Identification & Control
  - Risk Management
  - Problem Tracking

- Hazard Source
  - Major Hazards
  - Chemical Major Hazards
  - Hazardous Facilities
  - Hazardous Chemical Processes
  - Radioactive Sources

- Emergency Management
  - Emergency Plan Management
  - Emergency Process Record

- QHSE Management
  - QHSE Management Systems
  - Legal Regulations and Standards

- Statistical Analysis
  - Risk Statistical Analysis
  - Hazard Source Identification & Control
  - Hazard Source Statistical Analysis
  - Production Facility Query
Content

1. Company Overview
2. Risks and Challenges
3. HSE Management Practice
4. International HSE Practice
Working with international Companies

- Oil & gas E&P Cooperation Experience with many international companies;
- Also working with international contractors;
- Working with third party installation & facilities Certification Company
- Timely Updates industry incidents and learning
- Strong promotion to make International Standards & Specification to be widely apply
Member of International Associates

- Member of International Oil & Gas Producer (IOGP)
- Member of International Petroleum Industry Environment Association (IPIECA_)
- America Petroleum Institute (API) Standards
- OSHA Statistics Reporting Standards
- Report to OGP & IPIECA
- International Oil & Gas Incidents Lessons Learn & Sharing
Open HSE Performance

- Company Annual Report to shareholder, stakeholder, etc.
- Incident & Accident Reports (to government as legal required)
- OSHA Statistics Standards to report OGP
- Participant international HSE Conference, Seminar or Forum
- Sponsor & organizer for international meeting
- Making speech on international conference;
- International/Industry Published Standards & Good Practice Sharing
International Standards & Best Practice

1) 良好的作业实践（图示篇）
2) 安全风险分析方法
3) 航空器管理指南
4) OSHA 职业伤害和职业病统计办法
5) 天然气勘探开发集输事故案例
6) 作业任务风险评价指南
7) 潜水作业安全指导与合作机构 HSE 管理
8) 国外石油作业事故案例
9) 承包商健康安全环保管理
10) 海洋石油事故案例
11) 员工健康手册
12) 防硫化氢专集
13) 作业安全风险分析应用案例
14) 浮式生产储油装置安全规则
15) 安全警示 (2004 年)
16) 商业潜水与水下作业公认标准
17) 油气田岗位 HSE 资质
18) 国外成熟健康管理经验资料汇编
19) 带压堵漏技术
20) Z120-2 事故汇编
21) 国际海上溢油重大事故及对策研究
22) 安全警示与案例 (2005)
23) 国外石油公司健康安全环保培训管理
24) 海洋石油相关 HSE 体系汇编
25) 海洋石油 HSE 文件汇编
26) 国际石油安全标准化的管理体系和框架
27) 企业社会责任和可持续发展
28) 国外石油公司 HSE 体系审核要点
29) 英国海洋石油安全管理模式和对比
30) 石油化工 HSE 管理经验及规范汇编
31) 工程建设过程健康安全环保管理
Summary

- Company HSE Commitment and visible Leadership
- Understanding industry risks and challenges
- Familiar with the legal requirements
- Provide efficient control measure to close the gaps
- Comply the legal requirement is the bottom line
- Continuous improve HSE Management
- Effort on to be an international oil & gas company
THANK YOU