



# **SAFETY & RISK SERVICES**

**MANAGING SAFETY AND REDUCING RISK**

**SGS**



# MANAGING SAFETY AND REDUCING RISK WITH SGS

Workplace accidents are very costly and disastrous since they are directly associated with limb, life and degradation of environment. There are many cases of businesses going bankrupt due to a single serious accident given the property loss and hefty compensations. Besides ethical concerns and property losses, the businesses also suffer from costly and never ending litigations and very significant erosion in corporate image and reputation. Given the enhanced employee awareness on the hazards to their safety, health and societal awareness on environmental protection. Industries and businesses today face a challenge of ensuring a reasonable level of confidence that proactive Health Safety and Environment (HSE) management systems and procedures are in place to prevent any untoward incident or event.

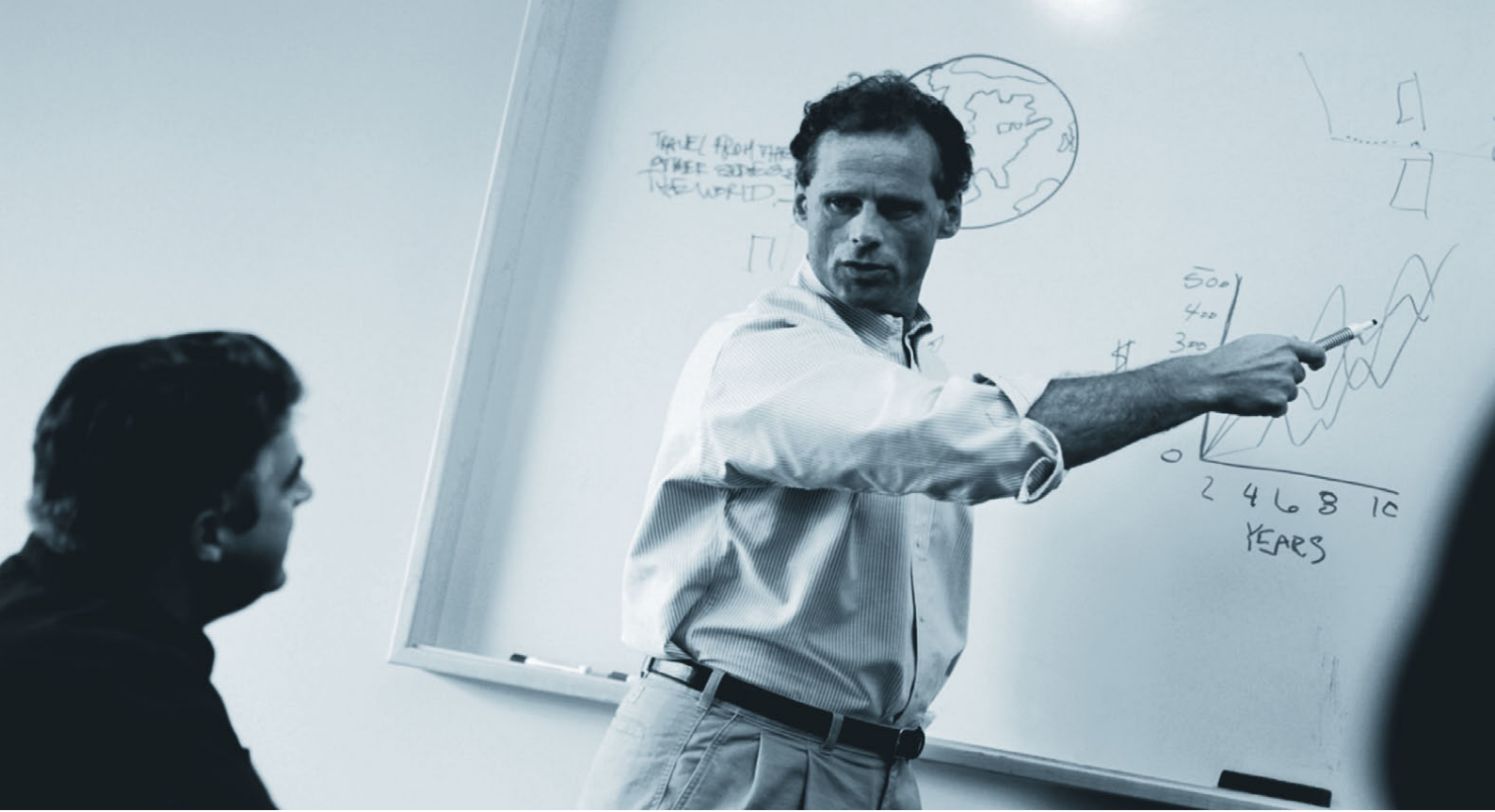
SGS offers a host of safety and risk services to help industry and businesses to

- Identify and recognise hazards to health and safety of employees and the public living in the vicinity of their business and reduce the risk to an acceptable level
- Know and adopt the best HSE related industry practices
- Reduce risk of litigation by identifying applicable regulations and ensuring compliance
- Enhance corporate image by demonstrating commitment to health, safety & environment concerns

SGS HSE services include

- HSE Training Services
- HSE/Safety Audits
- HSE Management & Supervision
- Hazard and Operability (HAZOP) Studies
- Quantified Risk Assessment
- In-Service Verification of Lifting Equipment
- HSE Documentation Services

The above safety and risk services are available for all industry sectors including oil & gas chemical process industries including power plants, petrochemical complexes, etc. engineering industries construction projects and retail and distribution sector.



# HSE TRAINING SERVICES

A major chunk of workplace accidents happen due to lack of knowledge and skills. Such workplace accidents can be avoided if employees are made aware of the workplace hazards and precautions to be taken by imparting suitably tailored safety training.

SGS offers customised courses for all categories of employees including

- Managers and executives
- Engineers and supervisors
- Safety/HSE officers and managers
- Safety committee members
- Technicians, plant operators and other skilled, semi-skilled and unskilled workmen including the contractor worker

SGS provides a variety of in-house training courses covering a wide variety of HSE concerns and issues faced by the industry. Training modules are need-based and specifically tailored to the processes, operations and activities carried out by the customer industry.

SGS HSE training courses help employees to understand and appreciate

- The hazards, control measures and safe work practices pertaining to the operations/activities they are engaged in
- Key HSE-related legal obligations
- Their role and responsibilities in managing HSE-related issues in an effective manner

SGS training courses are delivered with the help of

- Classroom sessions
- Relevant videos
- Group discussions
- Case studies
- Role plays
- Practical demonstrations

The participants are evaluated by tutors for their performance in the training course and accordingly awarded with

- Certificate of Successful Completion
- Certificate of Attendance

## HSE TRAINING COURSES – SGS TYPICAL

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>■ Behavioural Safety Awareness Course</li> <li>■ Construction Safety Management</li> <li>■ Safety Induction for Construction Workmen</li> <li>■ Safety in Scaffolding and Working at Height</li> <li>■ Safety in Crane Operation and Rigging</li> </ul> | <ul style="list-style-type: none"> <li>■ Plant Safety Management</li> <li>■ Safety in Material Handling</li> <li>■ Electrical Safety</li> <li>■ Safety in Confined Space Entry</li> <li>■ Safety Auditor's Course</li> <li>■ Hazard Identification and Risk Assessment</li> <li>■ Safety Orientation for Safety Committee Members and Stewards</li> <li>■ HSE Laws and Regulations</li> </ul> | <ul style="list-style-type: none"> <li>■ Process Safety Management</li> <li>■ HAZOP Operability Studies</li> <li>■ Safety in Storage, Handling and Transportation of Hazardous Chemicals</li> <li>■ Safety Training Courses tailored to clients' needs</li> </ul> |
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## HSE AUDITS

Over the period of time, deficiencies may creep in the HSE systems and procedures and employees may start ignoring them. Periodic HSE/Safety audits are an integral part of any HSE management system.

SGS helps industry and businesses in monitoring their HSE management systems and procedures and their appropriateness and effectiveness by conducting HSE/Safety audits of almost all kinds of assets and facilities including

- Oil & gas installations (offshore & onshore)
- Chemical process plants
- Cross country pipelines
- Storage terminals/depots of hazardous chemicals
- Engineering factories
- Construction project sites
- Warehouses
- Office buildings, malls and commercial complexes
- Retail outlets including Liquefied Petroleum Gas (LPG)/petrol/diesel dispensing stations

SGS HSE/Safety audit services aim at

- Identifying strengths and weaknesses in the HSE management systems and procedures
- Suggesting corrective actions to restore their integrity and effectiveness
- Ensuring the continual improvement in HSE/Safety performance
- Improving compliance with HSE related regulatory requirements

SGS offers various types of HSE/Safety audits depending on the nature of industry/occupancy, extent of scope of work and purpose of the audit such as

- Plant Safety Audit
- Electrical Safety Audit
- Fire Safety Audit
- HSE Legal Compliance Audit
- Construction Safety Audit
- HSE Evaluation of Sub-Contractors
- Process Safety Audit
- Environmental Audit
- Technical Audit of city gas distribution network and natural gas cross country pipelines as per Petroleum and Natural Gas Regulatory Board (PNGRB) India regulations

SGS HSE audits are often conducted by multidisciplinary teams comprising of experts from various disciplines including safety, fire protection, industrial hygiene, environment, electrical, mechanical, chemical, construction, etc.

SGS HSE/Safety audit services may be offered in conjunction with actual sampling, tests, laboratory analysis and measurements such as

- Earth pit test, cable insulation test
- Effluent analysis, ambient air and stack sampling and analysis
- Noise measurement, illumination and ventilation survey, industrial hygiene survey, etc.

SGS HSE auditors use extensive audit criteria which cover

- Applicable HSE related laws
- Relevant HSE related standards and codes of practice including Indian Standard (IS), International Organisation for Standardisation (ISO), Oil Industry Safety Directorate (OISD), National Fire Protection Association (NFPA), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), etc.
- Client specifications
- Good industry practices



# SAFETY MANAGEMENT AND SUPERVISION DURING CONSTRUCTION PHASE

An accident at a project site can have disastrous consequences for the project owner, contracting agencies and workmen as well. Besides property loss, a serious accident means

- Stoppage of work or interruption and delay in project completion
- Cost overruns
- Legal litigations and hefty penalties
- Damage to public image and market reputation

Implementation of safety systems and procedures is very important to ensure successful and timely completion of the project without any cost overruns.

SGS helps to establish and monitor the safety management system at the construction project sites by deputing its expert and experienced Safety Engineers at the project site on full-time basis.

The SGS Safety Engineers coordinate with the client's site management and its contractors and implement the safety control measures and specifically help the site/project management in the following

- Develop or review conditions of contract on safety and project safety manual
- Review of contractor's site safety plans
- Evaluation of safety systems and procedures of contractors
- Setting up of safety committee(s) at site and conduct periodic meetings
- Prepare or review risk assessment of high-risk operations and activities and method statements
- Carry out site inspection and audits
- Imparting safety training to site personnel
- Ensure regulatory compliances
- Benchmark the site safety practices
- Control and issue of work permits

The number of Safety Engineers to be deputed at the project site depends on

- Stage of the project
- Size of work site
- Number of contracting agencies
- Intensity of work activities
- Number of workmen working at the project site, etc.

This number is finalised in consultation with the site management of the project owner.

Safety Engineers continuously receive necessary support and guidance from our corporate Safety & Risk Services Wing.

Though SGS safety management and supervision services were primarily developed for project owners, they are being used with equal effectiveness by the major contractors as well as the project finance companies.



# HAZOP STUDIES

Oil & gas installations and process plants comprise of many complex systems, sub-systems and components such as process equipment, instrumentation, controls, safety devices, etc. Such equipment or components may deviate from its design intent due to malfunction or an error on the part of the plant operator during normal operation, plant start-up and shut-down or in the event of an emergency. Therefore it needs to be investigated how the plant responds to such expected deviations and whether it has sufficient control and safety features to cope with such deviations. This is achieved through HAZOP study.

**WHAT:** A brainstorming technique using a set of Guide Words and involving a team of experts having experience in design, operation and maintenance, instrumentation, safety, etc. of the process plants.

**WHEN:** During all phases of plant design from feasibility and Front-End Engineering Design (FEED), to detailed design, and construction, commissioning

and plant start-up stage for a new plant and also in the event of any modification in the existing plant.

**WHY:** To find deviations from design intentions.

## SGS HAZOP SERVICES

SGS helps the facility owner and Engineering, Procurement and Construction (EPC) contractors in oil & gas and other process industry sectors by providing experienced process safety engineers to facilitate the HAZOP sessions. SGS intervention begins with a short training module to help the client's team to understand the HAZOP concept and application and continue to guide the HAZOP participants and extract the best of their experience in design, operation and maintenance of such facilities through out the HAZOP sessions.

## HAZOP METHODOLOGY

- Data collection including Piping and Instrumentation Diagrams (P&IDs), process flow sheets, process equipment sheets, operating and design process parameters, etc.
- Divide the plant into nodes
- Describe design intent including process parameters for each of the nodes
- Apply guide words for each process parameters and specify the relevant deviations
- Identify all possible causes of deviations and their consequences
- Recommend control measures in addition to the existing ones to prevent or undesired consequences
- Cover all guide words and process parameters as applicable for each of the nodes



# QUANTITATIVE RISK ASSESSMENT

The oil and gas and chemical process industries are ubiquitous with large inventories of hazardous chemicals including explosive, flammable and toxic chemicals. Due to accidental release of such hazardous chemicals, many major catastrophic accidents have occurred leading to the loss of many lives and significant property loss. Few such glaring ones to name are Piper Alpha, Bombay High and Bhopal.

SGS's Quantified Risk Assessment (QRA) services help in identifying major accident hazards, understanding associated risks and establishing cost-effective measures to reduce them to As Low As Reasonably Practical (ALARP) level.

## QRA METHODOLOGY SGS TYPICAL

QRA starts with hazard identification and an evaluation of the likelihood and consequences of potential hazardous events. The quantified risks are then assessed by comparison against defined criteria. The QRA process typically includes

- Process Hazard Analysis
- Scenario Development
- Likelihood Frequency Analysis
- Consequence Analysis (such as fire and explosion modeling, dispersion modeling, etc.)
- Risk Assessment
- Recommendations for Risk Reduction Measures
- Reporting and Documentation

The most critical steps used by SGS in carrying out the QRA are given below.

## HAZARD IDENTIFICATION

It consists of a qualitative review of possible accidents that may occur, based on previous accident experience and judgment.

## CONSEQUENCE MODELING

It evaluates the resulting effects of process accidents and their impact on personnel, equipment and structures, the environment and business. SGS employs state-of-the-art software to evaluate the consequences of possible hazardous events.

## RISK ESTIMATION

Risk to life is often expressed in two complementary forms i.e.

- Individual risk – the risk experienced by individual person and
- Group or societal risk – the risk experienced by the whole group of people exposed to the hazard

## RISK ASSESSMENT

The next stage is to introduce the risk criteria which are yardsticks to indicate whether the risks are acceptable or otherwise. SGS helps its clients understand the relevant applicable criteria defined in national regulations, corporate guidance and well-established industry standards.

## RISK REDUCTION AND ALARP

SGS advises risk reduction measures based on well-recognised standards & codes of practice and best industry practices if the evaluated risks exceed the relevant criteria for risk tolerability.



# IN-SERVICE VERIFICATION OF LIFTING EQUIPMENT

The material handling and lifting equipment must be checked at regular intervals since they contribute a major chunk of workplace accidents.

SGS helps the industry by performing independent external inspection of all types of lifting appliances, tools and tackles to ensure their stability and ability to perform the desired or intended operation and remain in service for a certain time period. Such in-service verification is conducted as per the checklists prepared in line with the relevant Indian and international standards and codes of practice and normally include

- Visual inspection
- Functional and operational tests
- Load test
- Examining crane operations including the rigging practices
- Document review
- Recommendations to minimise the risk

## MOBILE CRANE INSPECTION

- Lifting capacity or safe working load
- Witness of load test
- Functional test for anti-two block devices
- Swing lock functional test
- Main hook block – Safe Working Load (SWL) marking, cable keeper, safety latch, number of falls, deformation of hook
- Cable drum – proper seating of rope on drums and sheave groves and minimum number of wire rope wraps on the drum
- Outrigger pads including locking pin
- Hydraulic system – fluid level and leakage
- Operational check – SWL indicator, boom length indicator, limit switches, level gauge, reverse horn, front, rear and parking lights, signal lights, aviation lights, brakes, etc.

- Other aspects such as guarding of rotating/moving parts, fire extinguisher in operator cabin, electrical installations, etc.
- Documents review – manufacturer's test certificates, certificate of last examination and test, load chart, insurance certificate, Registration Certificate (RC) Book, etc.

SGS offers in-service inspection for a wide range of lifting appliances and gear including

- Mobile cranes
- Tower cranes
- Electric Overhead Travelling (EOT) cranes
- Gantry cranes
- Chain pulley blocks
- Industrial trucks or forklifts
- Wire rope slings
- Hooks
- D shackles





# HSE DOCUMENTATION SERVICES

Preparation and update of HSE documentation is the key in establishing, implementing and monitoring the HSE management system at any workplace. Given its rich experience in tailoring as well as evaluating the HSE management systems and procedures for a variety of industries and workplaces, SGS is well placed in offering HSE documentation services including development and review of the following key HSE documents.

## **BID OR CONTRACT CONDITIONS ON HSE**

The contracting agencies are often caught unaware if the safety standards to be implemented during the project phase are not conveyed to them during the bidding process. SGS undertakes to prepare the contract conditions on HSE/ Safety and help the project owner in

- Making the contracting agencies understand its expectations pertaining to safety standards
- Reasonably transferring to the contractors, its legal obligations towards safety and environment protection

## **HSE/SAFETY MANUAL**

A good HSE/Safety Manual is the cornerstone and in fact the starting point in implementing the HSE management system at any workplace. SGS helps industry to either develop on review HSE/Safety manual by first identifying the workplace hazards and risks arising out of the activities and operations carried out at a particular workplace, applicable HSE-related regulations and then developing the control systems and procedures to counter the hazards.

## **EMERGENCY RESPONSE PLAN**

SGS helps the hazardous chemical industries in preparation of emergency response plan by identifying the possible emergency scenarios and devising the best possible organisational framework to guarantee a rapid and effective emergency response including emergency actions, roles and responsibilities of plant personnel, emergency equipment and communication facilities.

## **HSE LEGAL REGISTER**

SGS helps the industry and businesses to appreciate and fulfil their legal obligations pertaining to workplace safety & health and environment protection by identifying the laws and regulations applicable to the processes and operations carried out in their respective industries and workplaces and preparing the HSE legal register. Such a register normally include requirements for

- Licenses
- Approvals
- Authorisations
- Consents
- Periodic inspection, testing and examination
- Records

It serves as a ready reference for the industry managers in tracking their necessary periodic intervention for compliance with HSE legal requirements.



**AMERICAS**

**EUROPE, AFRICA &  
MIDDLE EAST**

**ASIA-PACIFIC**

## **GLOBAL EXPERIENCE AND LOCAL EXPERTS**

SGS is the global leader and pioneer in inspection, verification, testing and certification services. Founded in 1878, SGS is recognised as the global benchmark in quality and integrity.

We have been providing services in India since 1950 in the field of Industry, Petroleum, Minerals, Agriculture, Consumer Products, Environment, Quality Certification and other related services. With its Corporate head office

at Mumbai, SGS India today has a network of over 60 operating locations including 32 labs manned by over 4000 People, strategically spread across India.

SGS has a rich experience in offering safety and risk services in India and globally.

To know more about how SGS can help you enhance safety and reduce risk contact us at:

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WHEN YOU NEED TO BE SURE

