ALERT

FLASHPOINT

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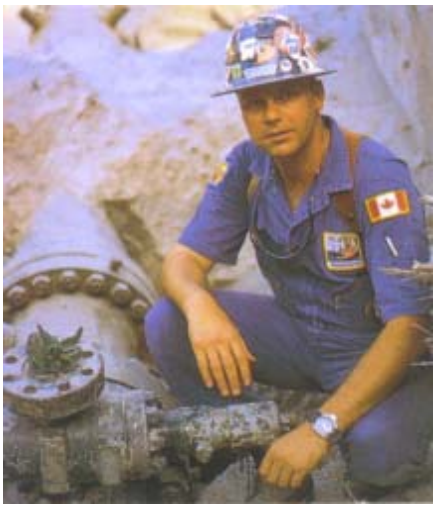
DNV Accredited ISO 9001 Quality Management System

ALERT DISASTER CONTROL

INCIDENT RESPONSE MANAGEMENT SYSTEM



THE petroleum exploration and production industry has continued to pioneer new technologies in its quest to meet global energy requirements. These technologies have been developed to meet the unprecedented challenges that our industry has faced throughout its history. As we explore for hydrocarbon reserves in harsher environments, deeper water and high pressure/high temperature formations, our industry has continually sought more effective methodologies to achieve our objectives in a professional, economical and environmentally sensitive manner.

This has seen the incorporation of Integrated Engineering Services, whereby selected service companies actually become a 'project partner' during the various phases of exploration and production. The operational and financial benefits to all parties can be significant. Through shared responsibility, the operator(s), drilling contractor and service companies participate, as a team, throughout the development phases of the well(s), including but not limited to, management, design, logistics, equipment selection, drilling, completion, production and workover.

However, critical elements often overlooked within Integrated Engineering Services are that of 'Incident Response Management' and 'Safety Management Systems'. These service elements truly enhance the overall effectiveness of any operation or Integrated Engineering Services program.

ALERT, in conjunction with the John Wright Company have developed comprehensive Incident Response Management and Safety Management System(s) designed to meet any operational requirement.

THIS system will provide working methodologies to safely and effectively: manage, respond to, and recover from an emergency such as a well control incident. Additionally, the system will provide guidelines for procedures and communication to:

- Minimize primary well control escalation.
- Safeguard human life if primary well control is lost.
- Professionally control the personal safety of those directly involved with the well control operations and ensure that control efforts are efficiently and effectively conducted.
- Commence with actions which will ensure that the extent of damage to the rig, surface facilities and location are minimized.
- Form a Source Control Unit(s) under the Incident Command System (ICS) to efficiently and effectively respond to bring the well(s) under control.
- Document planning steps to evaluate the most appropriate method for controlling the well.
- Ensure that all personnel taking part in the emergency are fully aware and familiar with the tasks they have been assigned and are adequately trained to accomplish their respective assignments.
- Minimize logistics and Source Control problems peculiar to the region of the well(s) location and its environment.

The Incident Response Management System shown within this newsletter deals with response to a well control incident. It is but one part of a total management plan for well control. The total Well Control Management System consists of five(5) major subsystems which collectively provide a total system approach to well control and management of its potential hazards. These subsystems are;

Incident Response Management

This subsystem details the Incident Response Organization (e.g., an ICS organization). It combines: facilities, equipment, personnel, procedures and communications operation within a common organization to: respond, intervene and recover from a well control incident.

Training and Drills

This subsystem deals with the qualification of personnel and contractors, training on procedures and policies, continued technical training in their field of expertise, conventional well control training, safety and emergency response training and drills, risk management training, etc..

Technology Management

This subsystem deals with proper procedures for well design, e.g.; proper drilling, completion and workover practices; well control procedures, emergency response procedures and equipment, QA/QC procedures for well design, equipment / tubular specifications and implementation, etc..

Risk Management

This subsystem identifies well control hazards, assesses the risk and impact of the hazards, identifies current controls to minimize well control hazards, identifies current ability to respond and mitigate the incident, identifies current controls to minimize incident escalation and identifies current ability to recover from an incident. This is the well and/or field specific contingency planning phase.

Information Management

This subsystem deals with ability to access the required information in a well control emergency. That it is up to date and accurate, that QA/QC procedures are in place for critical procedures. That the information gained in subsystems 1 - 4 is available in a usable format for the personnel involved in well control and well design.

How effective is your Incident Response Management System?

SAFETY MANAGEMENT SYSTEM

THE modern Safety Management System has become the primary resource utilized by progressive companies, throughout the world, to achieve loss control objectives.

Effective Safety Management Systems address not only conventional Health, Safety and Environmental(HSE) matters, but are moving towards elements of Total Quality Management.

With ISO 9000 and BS 5750 incorporating elements of 'safety' and ISO 14000 the 'environment', we see a greater impetus towards the adoption of integrated systems.

Safety Management Systems provide a structured development program through:

- Management and Employee Awareness.
- Direct Personnel Involvement.
- Enhancement of Personal Skills.
- Personal Motivation.
- Accountability, Responsibility and Authority.

Safety Management Systems, designed for specific applications, evolve to incorporate systematic analysis of each pertinent element within the program thus determining the extent and quality of management control.

The Need

The need for a safety program to prevent injuries has long been recognized as a necessary part of business. Yet, in recent years, the correlation between a good health and safety program and optimum profits has been increasingly recognized. Safety in the modern context and for the purpose of that presented within this newsletter is defined as control of accident loss. Safety today involves not only the prevention and control of injuries and occupational diseases, but also includes damage to property. There are at least three reasons this is so – the predictive value, the costs, and the inter relatedness of people, equipment, material and the environment.

The Value

Many different indices have been used through the years to measure safety. These include frequency and severity rates of worker injury and death. In addition, a variety of indices have been used to measure fire and other property losses.

Most measurement techniques used in the past have had one thing in common. They have been reactive and oriented to consequences rather than being predictive and before-the-loss. There is no doubt that these measurements will continue to serve a useful purpose in the future. However, safety specialists recognize that they are grossly inadequate. There is clearly a need for additional indicators that are predictive and before-the-loss. Measurements are needed that will enable managers to identify specific deficiencies that can be corrected or controlled before accidents and losses occur. Much insight in this regard comes from current safety research.

A recent study, "Success and Failure in Accident Prevention", was undertaken in the United Kingdom by the Accident Prevention Advisory Unit of the Health and Safety Executive. This extensive study was summarized as follows:

"Any simple measurement of performance in terms of accident frequency rate or accident incidence rate is not seen as a reliable guide to the safety performance of an undertaking. The report finds there is no clear correlation between such measurements and the work conditions, in injury potential, or the severity of injuries that have occurred. A need exists for more accurate measurement so that a better assessment can be made of efforts to control foreseeable risks. It is suggested that more meaningful information would be obtained from systematic inspection and auditing of physical safeguards, systems of work, rules and procedures and training methods, than on data about accident experience alone".

A British Chemical Industry Safety Council report, "Safe and Sound", states that the top management of U.S. chemical companies, noted for profitability as well as good safety records, were convinced that effective safety and loss prevention programs were essential for a company's prosperity and accepted as part of good business. The report suggests that one requirement of such programs was that their efficiency should be checked by safety audits to insure that a company's assets are effectively safeguarded. A system of unbiased auditing should use the best people available from inside and outside the company.

In summary, it can be said that any activity of a company, including safety, if not properly monitored can deteriorate to produce losses involving people, property and profit. The need for companies to protect their assets by taking appropriate measures to control losses has never been greater. It is a primary goal of the Safety Management System to give management the ability to monitor and implement proactive procedures crucial to the prevention and control of loss.

How effective is your Safety Management System?

THE QADIRPUR PROJECT

ALERT recently completed well control operations involving a severely damaged gas well within the Sindh Province of Pakistan. The project presented considerable challenges through limited well location data, well/site conditions, logistics and regional strife. **ALERT** undertook the entire operation through a 'Turnkey Project Management Services Agreement', the first of its kind in the well control industry.

Introduction

The Qadirpur Well No. 04(QP04) gas well was drilled in 1991 by the Oil and Gas Development Corporation(OGDC). The Qadirpur Field is located within the Indus River flood plain approximately 425 km northeast of Karachi, Pakistan. Prior to completion of a 'flood protection bund' around the Qadirpur Field, the area was subjected to abnormal '100' year floods. This resulted in a by channel of the Indus River, the Nagwa Channel, to change its direction and aggressively erode the embankments adjacent to the QP04 location. Through a combination of severe 'scouring' effects induced by the river flow, forces created by the river embankment, and excessive 'loading' by the concrete drilling pads and cellar, the QP04 collapsed into the Nagwa Channel. The QP04 casing failure occurred at the river bed approximately 15 meters below the original location elevation.

A courageous attempt to locate and secure the well was undertaken by OGDC inconjunction with local resources and the Pakistan Navy. These efforts were unfortunately unsuccessful. The physical and technical challenges were extensive. An international tender was issued by OGDC to the worlds leading well control, civil engineering and construction firms.

ALERT conducted an initial site assessment prior to presenting a comprehensive proposal for well control operations. The report included various well control options available to OGDC, inclusive of, operational procedures, associated risks, resource allocation and cost analysis.

OGDC undertook an extensive evaluation of the various proposals presented. The contract was awarded to **ALERT**. The official contract signing was witnessed by Prime Minister Benazir Bhutto of Pakistan and Prime Minister Jean Chretien of Canada on 15 January 1996 during the 'Team Canada' trade mission.

Operations commenced on 15 January 1996 and were completed successfully on 31 May 1996.

Scope of Work

The project encompassed the following services, as provided by and/or through **ALERT**:

- *Project Management*
  - site/operations management
  - equipment/personnel logistics
  - daily project status reports
  - project cost control
  - government liaison
  - insurance liaison
- *Safety Management*
  - personnel training
  - implementation and monitoring
  - report preparation
- *Environmental Management*
  - camp and site areas
  - environmental impact monitoring
  - report preparation
- *Marine Seismic Operations*
  - magnetometer survey
  - side scan sonar survey
  - echo sounder survey
  - data correlation
- *Land Seismic Operations*
  - ground penetrating radar survey
  - data correlation
- *Civil Engineering*
  - planning and design
  - site construction supervision
- *Civil Construction*
  - road construction
  - ramp construction
  - berm construction

Ground Penetrating Radar along the initial berm construction.

Cofferdam "Sheet Piling" Construction/Dewatering Well in foreground.

- drilling of probe holes
- drilling of dewatering wells
- cofferdam construction
- site excavation

• *Well Control Operations*
- hot tapping operations
- abrasive cold cutting operations
- capping operations
- hydraulic workover/snubbing
- drilling operations
- well killing operations
- plug/abandonment operations
- wireline operations
- cementing/pumping operations

• *Relief Well Engineering*
- planning and design
- hydraulic well kill modeling

• *Relief Well Operations*
- site supervision
- site surveying operations
- directional drilling operations
- MWD operations
- well survey operations
- wireline operations
- electromagnetic ranging

• *Replacement Well Engineering*
- planning and design

• *Equipment Import/Export*
- shipment
- customs and excise
- transportation logistics

• *Camp Accommodations*
- camp construction/management

• *Medical Services*
- site and camp facilities
- advanced life support paramedic

• *Logistics Support*
- local resource management

• *Security*
- personnel
- site and camp facilities

Project Management

ALERT's Project Management Team consisted of two(2) personnel, Mike Allcorn (Project Manager) and Tim Chetwynd (Site Manager). Initial activities focused on procurement of equipment and logistics support services required to facilitate the entire operation. Pre-qualification of international and regional service companies by **ALERT** during the initial site assessment expedited commencement of operations considerably. All services were tendered and contracted directly by **ALERT**.

Time was of critical importance. Through analysis of the Indus River flood and flow velocity tables, all operations would have to be completed and equipment demobilized from the Qadirpur Field by no later than 15 June 1996. Development of a 'critical path' flow chart indicated operations would be completed prior to 07 June 1996.

The Project Management Team were assisted by two(2) additional **ALERT** personnel. These men were each assigned independent duties. Doran Jorgensen assisted with well control activities while Tony Godsoe provided advanced life support medical services due to the well sites remote location.

Safety Management System

Through implementation of the **ALERT** Safety Management System the project recorded zero(0) Total Loss Time Incidents. This figure was based on the entire project covering 152 operational days involving 420 personnel working a total of 441,920 man hours.

Environmental Management

The well condition presented a severe potential impact to the Indus River ecosystem. In recognition of this concern **ALERT** implemented an environmental impact assessment of the well control and relief well operations. The specific works included: establishment of baseline environmental conditions adjacent to the well site(s); review of civil construction operations for regulatory compliance and mitigation of environmental impact; development of contingency plans pertinent to possible environmental impact; training of local staff to undertake the monitoring of the well site(s) during construction and well control operations; and final assessment of the well site(s) conditions upon completion of the well control operations.

Marine Seismic Operations

Marine seismic operations involved a hydrographic – geophysical survey within a specific section of the Nagwa Channel. The purpose of the surveys was to locate the exact position of the damaged well buried within the river bottom. The surveys were completed through; utilization of a DGPS survey vessel with initial survey sweeps using a marine proton magnetometer to fix the position of the wellhead; followed by sidescan sonar and echo sounder surveys to determine the structure on the river bed.

Land Seismic Operations

Analysis of the marine seismic data resulted in construction of the initial berm into the river channel. Upon completion, ground penetrating radar surveys were conducted while moving across predetermined transects marked out on the earth berm. Anomalous features were identified immediately and specific areas were delineated for further investigation. Interpretation of these features provided a clear two dimensional grid profile of the damaged well structure.

Hot Tapping 13 3/8" Casing.

Civil Engineering

Civil engineering and construction supervision entailed: selection of construction materials; design of the berm together with erosion protection; design of sheet pile cofferdam and dewatering system; preparation of construction drawings; preparation of construction specifications and bill of quantities; monitoring of flood cycle

and flow velocities; and provision of site engineer(s) to monitor and record construction activities and ensure conformance with specifications.

Civil Construction

Site construction activities entailed; construction of 13km of site access roads and maintenance of the same for 150 days; construction of an initial earth berm of 18,000m_3 and final earth berm of 35,000m_3 complete with erosion protection; drilling of 144 x 17.22m(2,480m) probe holes; drilling of 12 x 30m dewatering wells; operation of 10,000 liter/min capacity dewatering system for a total dewatering of 1,440,000m_3 over 100 days of site activities; installation of 1,598m_2 of sheet piling and 42t of wailing and bracing; excavation of 4,095m_3 of earth from within the cofferdam; removal of 430t of damaged concrete (drilling pads and cellar); operation of equipment and personnel river crossing transport for a total of 3,300 cycles (495km); and restoration of the site upon completion of operations.

Well Control Operations

ALERT commenced well control operations upon excavation of the cofferdam and exposure of the damaged wellhead and casing structure. Extensive damage to the wellhead precluded direct well intervention. Well control operations encompassed; installation of firefighting pumps and monitors, safety equipment and gas monitoring systems in and around the cofferdam structure; construction and installation of working platforms; staged hot tapping and high pressure abrasive cold cutting operations whereby sections of the 13 3/8" and 9 5/8" casing were cut out allowing access to 'hang off' the 3 1/2" tubing; removal of the damaged casing and wellhead structure; installation and pressure testing of a 13 5/8" 5K casing head and tubing hanger; installation of a 225K hydraulic workover/snubbing unit, modified pipe handling system, divertor system, kill and choke manifolds; installation of cementing and pumping system, mud plant and bulk storage system.

Hydraulic Workover/Snubbing Unit.

Plug and abandonment operations included; removal of 3 1/2" tubing string previously hung off within the well; drill out of three(3) separate bridge plugs temporarily placed within the 9 5/8" prior to final completion program; pressure control operations; control and isolation of loss circulation zones within the 8 1/2" open hole section; control and isolation of abnormal pressure zones; placement of cement intervals and squeeze programs across the 9 5/8" casing shoe; placement of cement intervals and squeeze programs isolating three(3) separate perforated zones within the 9 5/8" casing; installation of bridge plugs and cement intervals to surface; cementing operations within the 13 3/8" x 9 5/8" annulus.

Cementing/Pumping Units.

Upon removal of the hydraulic workover/snubbing unit and casing head assembly the 9 5/8" casing and 13 3/8" casing were capped approximately 3 meters below the river bed.

Relief Well Engineering

Surface control operations had a high probability for success. However, due to uncertain well conditions and a restricted operational window, OGDC prudently requested **ALERT** to prepare a relief well emergency plan.

Relief well engineering was complicated due to; inaccurate preliminary survey data made available to **ALERT**; and restricted location access requiring the relief well site to be located in excess of 800m from QP04.

Relief well engineering activities included; resurvey of the well sites; inspection of the allocated drilling rig; blowout hydraulics simulation and modeling; relief well kill planning; identification of relief well drilling equipment, tools and resources; identification of well kill equipment and resources; and contingency planning.

Relief Well Operations

OGDC requested commencement of relief well operations on 04 April 1996. The relief well plan projected intersection of the QP04 casing on or about 28 April 1996. Approximately 36 hours prior to anticipated intersection of the QP04 casing, surface control operations on the damaged well were successfully completed. This eliminated the need to continue dropping angle for intersection of the QP04 and subsequently 'plugging back' the relief well. The relief well bypassed the QP04 casing at a distance of ±2m. The relief well was then turned over to OGDC on 02 May 1996 for completion of drilling operations and transition to a replacement well.

Replacement Well Operations

ALERT prepared the replacement well drilling program in consultation with OGDC. Upon successful completion of relief well operations the well was drilled

to the predetermined 'target'. Upon setting casing further well completion activities were suspended. This was to ensure that sufficient time remained to demobilize the drilling unit from the area prior to commencement of the floods.

Equipment Import/Export

ALERT coordinated all equipment import and re-export requirements, inclusive of customs and transport logistics.

Camp Accommodations

ALERT coordinated installation and management of the camp facilities required to support all service company personnel.

Medical Services

ALERT 'ALS Paramedic' services were incorporated within the project due to the remote location, operational activities and the number of personnel involved. Full advanced life support systems and contingencies for possible air medivac were established. **ALERT** 'ALS Paramedics' recorded a total of 327 medical treatment cases. All medical treatment cases were non-work related. All medical treatment cases were related to medical 'first aid' assistance extended by **ALERT** to all of the sub-contractors families and tribal people within the project area.

Alert ALS Paramedic Services 'Tony Godsoe treating local girl who sustained burns while falling into a village camp fire.'

Logistics Support

ALERT coordinated all local logistics support through the kind assistance of the Sundrani Family. As the local landlords, the Sundrani Family history spans an estimated 235 years of progressive development within the area. The family were instrumental in assisting **ALERT** with all local requirements and logistics support. The Sundrani family were at all times 'honorable' and true friends in every sense of the word.

Alert Project Team
"Tim Chetwynd, Mike Allcorn, Doran Jorgensen and members of the Sundrani Family."

Security

Security of all personnel and site equipment was of critical importance due to 'Dacoit' activities within the area of operation. In addition to recorded kidnappings of foreigners, the area was susceptible to armed attacks and robberies. OGDC stationed security forces within the project area for protection of our personnel and equipment. However, upon commencement of operations the well site was attacked by 'Dacoit's' which resulted in evacuation of the area under 'heavy arms fire'. The site was devastated.

ALERT co-ordinated all further security requirements through the kind support of the Sundrani Family. This included personal body-guards, restricted travel procedures, installation of heavy weapons posts around the site perimeter, clearing of a 'free fire zone' around the site perimeter and 24 hour perimeter patrols. **ALERT** did not experience any further direct incidents as a result of 'Dacoit' activities. However, there were several attacks experienced throughout the term of the project by other project sites within the area. This included heavy arms fire, mortar and RPG attacks within 1000m of the well site.

Conclusion

The Qadirpur Project posed unique challenges. The operations were completed successfully within budget and original time projections. The success of the project was attributed to a thorough analysis and coordination of all project phases, and a positive 'team spirit'.

Removal of Casing Head.

The following companies were instrumental in the projects overall success. Their professionalism and perseverance while working under extreme conditions including; 'Dacoit' attacks, ambient air temperatures ranging from 0-50° Celsius, hurricane force winds and floods, were commendable.

- Ministry of Petroleum & Natural Resources of Pakistan
- Oil and Gas Development Corporation of Pakistan
- Qadirpur Joint Venture Partners
- Shahzad International
- The Sundrani Family
- John Wright Company
- Well Flow Dynamics
- Vector Magnetics
- Agra Earth & Environmental
- Halcrow Engineering Pakistan
- IVCC Construction
- Fugro Geodetic
- Anadrill Schlumberger
- Dowell Schlumberger
- Schlumberger Wireline & Testing
- High Pressure International
- Matthews- Daniel Company
- Scientific Drilling Controls
- Weatherford Enterra
- FMC Southeast Asia
- Hong Leong Corporation
- G. T. Freight Forwarders
- International Moving & Trading
- S. Zia-Ul Haq & Sons
- THE **ALERT** TEAM

'COME HELL OR HIGH WATER' WE DID SUCCEED

THE INTERNATIONAL ASSOCIATION FOR SEA SURVIVAL TRAINING

THE International Association for Sea Survival Training(IASST) was established in 1986 by several of the major North Sea training providers in existence at that time. Today the Association's membership has grown to well over 100 members covering 31 countries throughout the world.

The Association is committed to improving the quality of sea survival training through the exchange of knowledge and experience gained between the various safety training provider members.

Included in it's membership list are renowned universities, maritime and nautical colleges, coast guards, rescue coordination centers, research organizations, private and publicly owned safety training schools and manufacturers and suppliers of a broad range of safety equipment for the maritime and aviation industry.

Individual core members possess an impressive list of credentials and a broad spectrum of industry experience, including seafaring backgrounds with worldwide shipping trades, master mariners, pilots from the civil and military aviation industry, ship officers and marine engineers.

The Association actively participates in a number of international safety conferences and individual members frequently serve as guest lecturers and instructors for safety training organizations.

The IASST offers the most updated information, competency based skills and knowledge in the following areas:

- Life Saving Appliances
- Training Methodologies
- Training Techniques
- Sea Survival Training
- Emergency Communication
- Search and Rescue Tactics
- Medical Care
- Ship Damage and Control Tactics
- Crisis Management
- Emergency Response
- Pollution Control
- Offshore Damage and Control
- Fast Rescue Craft Boat Handling
- Ship Operation Management

To name but a few disciplines.

The IASST is not a competitor to the UN IMO organizations, but rather an important supplementary group whose mission is to improve the skill and competency levels within sea survival training.

Our members have a common interest to improve the understanding of safe working practices, heighten the awareness of potential hazards and to ensure effective employment of life-saving procedures and the use of appliances, should the need arise.

ALERT is a National Representative for the International Association of Sea Survival Training.

STCW95 – TOWARDS THE FUTURE

ALERT, in keeping with the style of progressive development that we have become noted for, is pleased to announce enhanced training for those customers requiring International Maritime Organization (IMO) certification or those customers requiring a superior standard of training for their personnel.

Having conducted IMO courses such as Personal Survival, Proficiency in Survival Craft and Advanced Firefighting in compliance with STCW 78, **ALERT** has decided to adopt STCW 95.

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, was adopted by the International Conference on Training and Certification for Seafarers on 07 July 1978.

The 1978 STCW entered into force on 28 April 1984. Since then three (3) amendments have been adopted, the most recent being 1995. While previous amendments addressed specific systems and developments such as the Global Maritime Distress and Safety System, STCW 1995 has modernized the entire Convention.

Complete revision of the annex to the 1978 STCW Convention became necessary in order to clarify the standards of competence required and to introduce qualification requirements for trainers and

assessors. These two (2) issues have always been of foremost importance at the **ALERT** Safety and Survival Training Center. **ALERT**'s programs have always been of a competency based nature, even those programs where a certificate of attendance is issued, and the quality of **ALERT** instructional staff is second to none.

STCW now gives a definitive standard to those programs which are applicable. Not a standard based on the duration of a course or solely on the score achieved by participants on a written examination, but one of competence.

At a time in history where unprecedented amounts of capital have been expended on studies into why human error is the number one cause of loss to industry, we see a greater impetus towards competency based training.

While STCW 95 has not been fully adopted by any of the one hundred and eighteen (118) Port States contracting to STCW 1978, **ALERT** has decided to pursue this inevitable step towards a safer and productive offshore / maritime environment.

If you would like further information on any of the articles or services mentioned within this newsletter, please contact:

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