

Faculty of Occupational Medicine

Wilf Howe Memorial Prize 2014

Winning submission by Dr Will Ponsonby

Implementation of an Occupational Health Management System in the Majnoon Oil Field in the Republic of Iraq

1. Clear description of innovation, initiative or intervention

Implementation of a comprehensive occupational health system in a brown field oil and gas field in the Basra Province of Iraq.

A multidisciplinary team were responsible for implementation of the Project:

- Dr Will Ponsonby, Regional Health Manager
- Andrew Dempster, Project Health and Safety manager
- Natashia Fourie, Project Occupational Hygienist
- Miguel Ruiz-Larrea, Social Performance Manager Iraq

The project required implementation of a comprehensive occupational health management system where none had existed previously. This was required within a diverse work force that were from different ethnic cultural backgrounds with very different experiences of the oil & gas industry.

The Key elements of the occupational health programme were:

1. Medical Emergency Response

- a. First aid and defibrillation in four minutes
- b. Tier 2 medical response from a paramedic or doctor in one hour for advanced care
- c. Admission to an approved hospital in four hours
- d. Referral to specialist centre as required

2. Health Hazard Management

- a. Carry out a health risk assessment for all activities by a competent person
- b. Identify assess control and arrange recovery measures for all health hazards to reduce risks ALARP
- c. Assign and track all remedial actions to close out
- d. Set up a HACCP system to manage food hygiene and safety
- e. Set up a system to manage the risk of Legionella
- f. Set up and roll out a system to manage working in a hot climate (temperatures up to 55 C in summer)
- g. Set up systems to manage health of workers during the Holy Month of Ramadan

3. Fitness to work

- a. Programme to check all international staff are fit to come and work in arduous conditions in Iraq (OGUK standard or equivalent)
- b. Task specific medicals for food handlers, drivers, crane operators, BA wearers, Emergency Response team workers, food handlers

4. Drug and alcohol program

- a. Develop and educate workers on a program to control use of drugs and alcohol in the work place

- b. Set up system for carrying out drug and alcohol test as required

5. Workers Welfare

- a. Ensure all worker camps meet minimum requirements
 - i. Air conditioned bed rooms
 - ii. No over crowding
 - iii. Sufficient and good quality food (HACCP system in place)
 - iv. Exercise and leisure facilities available
 - v. Facilities to communicate with families
- b. Fatigue management for workers, adequate sleep time, good sleep hygiene

6. Social Performance

- a. Ensure health projects included in the health programme are fit for purpose
- b. Improve health capacity in local communities and in Basra Province
- c. Working in conjunction with NGOs and the Ministry of Health to bring health care to communities which previously had none
- d. Setting up innovative programme to bring post graduate medical education programme to Iraq
- e. Recruitment and training of national doctors to take over health management as a part of the company's commitment to local content

7. Incident Reporting and Investigation

All occupationally caused illnesses and injuries should be reported. They are classified according to severity under the OSHA system. Targets are set for Total Recordable Case frequency and the number of man hours worked Lost time Incident Free are tracked. All serious incidents are investigated with root cause analysis.

2. Description of working population

Majnoon field is situated on the South East of Iraq in Basra Province close to the Iranian Border. It was a partially developed oil field, producing 50,000 barrels of oil per day. Shell won the license to operate and develop the field in 2009. The targets were to increase production to 175,000 barrels of oil per day in the first few years (First Commercial Production FCP), and subsequently increase production to 1.8 million barrels per day (Full Field Development FFD) over the coming years.

For FCP the workforce was to expand from 300 to more than 5,000 at peak to allow for drilling of new oil wells, construction of production facilities and pipelines. The oil field was an old battle field from the Iran Iraq war and was heavily contaminated with explosive remnants of war (ERW). ERW in the work areas had to be removed and made safe before work could commence.

The area of the Majnoon Oil field was previously part of the Mesopotamian Marshes. These had been drained by Saddam Hussain, and the Marsh Arabs had been persecuted. Many fled to Iran and only returned after the fall of Saddam. Because of this many of the Marsh Arabs had little formal education and few specialised skills.

The work force was drawn from two main sources:

- The Iraqi work force. There was a small number of existing Iraqi workers who had good knowledge and skills who were seconded in from the National Oil Company. However, many of the national staff had not worked in the oil and gas industry previously, they had no experience of a health safety management system and many had little education. Many of the workers were illiterate even in Arabic.
- The international work force is made up of more than 1,500 international workers from many countries including, India, Pakistan, UK, The Netherlands, Turkey, Italy, China. This presented us with differing cultures, languages and background health issues.

The challenge was to provide and induct all workers in healthy and safe systems of work. Many had no previous experience of the safety requirements of the oil and gas industry. Many did not have any English and for most of the rest it was not their mother tongue.

During the course of the project, contractors were being mobilised and stood down as they were commissioned and completed defined packages of work, there was therefore a constant churn of staff. All new staff needed to be inducted on the Health and Safety management system and the health requirements.

3. Reasons for choosing 1 and 2, including organisational context

This has been a major challenge over the last four years to set up and operate a major construction project in an area, with an ongoing insurgency, on a battlefield still heavily contaminated with mines and bombs. The project had to conform to international standards local law and Shell's own Health and safety Management system. Our aim was not only to ensure the good health of workers on site but to have in place a secure medical treatment system if the workers became ill or injured. In addition we wanted to optimise worker welfare. Plus with the local community and other stakeholders, to improve the quality of health care in Southern Iraq.

This has been one of the more difficult projects from a health point of view that Shell has undertaken in the last decade. Health was a business critical enabler, if we had been unable to secure a reliable health management plan the project may not have been able to go ahead. We have also been able to move Health from being a business hygiene factor to being a key business enabler. The good will engendered by the health projects has differentiated the company as a good neighbour, and so facilitated their work in Iraq.

4. How did you measure outcomes?

Outcomes were measured in a number of ways

- Number of work caused fatalities
- Number of Non-Accidental Deaths (deaths due to non-work caused natural causes e.g. a heart attack)
- Number of Lost Time Incidents
- Number of hours since the last Lost Time Incident
- Total recordable case frequency (the number of injuries of severity Medical Treatment Case of more Severe per million man hours)
- TROIF, total recordable occupational illness frequency
- Numbers of staff trained
- Recorded activity levels in community projects. Currently a study is being launched in the communities to measure outcomes and to judge if health programs have impacted community health parameters

5. What were the health benefits?

Majnoon Project HSSE Data 2010 to 2013

	2010* ¹	2011	2012	2013
Man hours	635,789	3,820,784	11577830 (Cumm. 2013)	13673539
TROI	0	3 (Contractors)	0	2 (Contractors)
TROIF	0	0.8	0	0.15
TRC	4	9	21	29
TRCF	6.3	2.6	1.8 (Cumm.)	2.1
LTI	2	4	3	3
LTIF	3.1	1	0.3 (Cumm.)	0.22
NAD	0	1	0	0
Fatalities	0	0	0	0

TROI Total Recordable Occupational illness; TROIF Total Recordable Occupational Illness Frequency; TRC Total Recordable Cases; TRCF Total Recordable Case Frequency; LTI Lost Time Incident; LTIF Lost Time Illness Frequency; NAD non-Accidental Death

In 2012 Majnoon Field Development achieved 10 million man hours LTI free.

Medical Emergency Response positive outcomes Life Limb and Eyesight

- Two cases of cardiac arrest successfully treated with defibrillator and resuscitated, both successfully discharged from hospital
- Two serious medical cases treated and patients returned to work
- One unconscious casualty in a vehicle roll over, with severe head injury C-spine and airway managed at accident scene, transferred to hospital and made a full recovery
- One penetrating injury to the eye transferred to Dubai for surgery sight saved
- Partial amputation of left wrist, stabilised transferred to Dubai, hand saved after 8 hour surgery

Emergency Medical Training

- More than 200 designated first aider trained (five-day advanced first aid course)
- Advanced care training for four Iraqi Paramedics
- Iraqi doctors sponsored to take training in occupational medicine abroad
- Four-day occupational health course held in Basra in conjunction with Emirates University

Community Projects

- Clinics local to the project were upgraded
- Established Continuous Medical Education for Medical and Nursing Staff in local region
- Established a network of Women Health Volunteers, educated to act as community health workers. As a result 20 women appointed, and each were allocated 50 families to visit
- With the Ministry of Health and Education Established a health education programme in Schools, delivered by the teachers. This was so successful that the Village Council asked us to extend it to all schools in the area
- For villages that did not have a clinic we established mobile clinics, who travelled in the poorest and most remote areas to provide medical care

6. Give an account of the difficulties / obstacles that arose and how they were addressed

1. Initially one of the main difficulties was getting access to work sites and stakeholders because of the security situation. We had to travel everywhere in a security convoy of four

vehicles. We actually made a virtue of this by ensuring that there was a medic in everyone of these security convoys. This meant we were able to quickly treat casualties, and as we always despatched security first to any incident, medical response was already embedded.

2. Government bureaucracy was also difficult, at first after withdrawal of the US Military, there was little in place. Slowly increasing regulatory requirements were introduced. Shell sought to influence the legislation process to make sure it reflected international best practice and where possible was risk based. However, despite that there were significant delays in obtaining visas, and importing equipment. Shell has a strict anti-bribery standard and so we had to slowly work with the system to manage the above issues. It took us more than 18 months to negotiate customs clearance for the ambulances. During the project we worked with the Health Directorate to develop, explaining the systems of occupational health management. We met to have seminars and delivered Occupational Health Training courses in Conjunction with Emirates University and the Faculty of Occupational Medicine of Ireland.
3. The Iraqi companies we worked with often had very little background in Health and Safety Management. The HSE systems were often either rudimentary or absent. We had to work very closely with the companies to induct them, and educate them in Health and Safety management. This comprised training courses, pre-mobilisation audits, tool box talks, on site supervision and regular audits and engagements. With a combination of the above we were able to make significant improvements.
4. In the months of June, July, and August temperatures reached up to 55 C in the afternoon. Also the Holy Month of Ramadan fell over these months as well. As the majority of workers were Moslems they had to fast for the hours of daylight, and were not able to eat or drink. We learnt from another Shell project in Qatar and adopted a simple flag system to control work in the Heat. Above a 32C a red flag was put up and all workers had to take regular breaks and drink water. Above 50 C all non-essential work stopped. Work that had to continue only did so with specific controls. Where possible we scheduled heavy manual labour at the cooler times of day. Some night working was implemented. During Ramadan work stopped at midday and resumed in the evening after Iftar (the breaking of the fast).
5. Medical Emergency Response, the local infrastructure was well below international standards and because of security difficult for the international staff to access. Evacuation times to the nearest centres of medical excellence by air ambulance were at best eight hours and often much longer. The international airport was often closed at night. We therefore needed a solution not only for Shell but for all the companies working in Iraq. We therefore formed a consortium of companies, and commissioned the Institute of Remote Health Care to specify what type of facility equipment and competencies were required. They provided a blueprint and a commercial medical company was commissioned to provide that, and the oil companies formed a cooperative to fund the venture. This was extremely successful and resulted in a single higher quality facility which because of the activity levels had staff that were able to maintain their competence.

7. Explain how this might be used elsewhere

Many elements of the project are applicable in other projects in Iraq and elsewhere. The lessons around contractor management, working with the community and local authorities, and cooperating with other companies to develop and set up shared infrastructure were particularly valuable. Shell has a system of reviewing projects to learn and retain any lessons so they can be applied elsewhere. Indeed some of the health management system in this project was a result of lessons from previous projects.