



SPE 86645

## SARS Response And Experiences Post The 2003 Outbreak And The Effect On Moving Rotating Staff To Offshore Operations

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This paper was prepared for presentation at The Seventh SPE International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production held in Calgary, Alberta, Canada, 29–31 March 2004.

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### Abstract

The Severe Acute Respiratory Syndrome (SARS) in 2003 is an emerging disease that spread rapidly worldwide. Remote and offshore operations appeared particularly at risk for various reasons. Medical teams were not prepared for the management of outbreaks. The density of population made close contact transmission possible. Remoteness resulted in misinterpreted information, weak and delayed adapted support, and improbable medical evacuation.

As a result, companies immediately set travel policies and screening procedures to decrease the probability of having someone on site presenting early signs of SARS. In cooperation with site management, alert level policies were implemented to plan responses adapted to pre-defined thresholds of risk. Information and training focused on prompt detection and isolation of cases, strict infection control in medical facilities, and the tracing and quarantine of contacts. Specific SARS management kits were elaborated to address the treatment of suspect cases, the organisation of isolation and the protection of medical teams. Medical evacuation of cases became a challenge due to medical transportation issues, operational limitations and international administrative constraints. Information dissemination services and email alerts were set up via a SARS dedicated web site in order to provide compiled data and operational information to medical directors.

This paper will review the experiences of companies tackling the SARS outbreak in remote settings. In the absence of a vaccine, robust diagnostic tests and specific treatment, this medical issue appeared initially to have no medical, but only operational answers. Options chosen in terms of staff management, treatment abilities and evacuation capacities will

be discussed. In conclusion, the importance of appropriate communication and accurate information will be analysed to help corporations make appropriate decisions in such challenging circumstances.

### Introduction

The severe acute respiratory syndrome (SARS) is described as the first epidemic of the XXI century. SARS hit the world in November 2002 when the first cases of atypical pneumonia were reported from the Guangdong province, South China. The disease rapidly spread to Hong Kong, Vietnam and Singapore, and then reached other hemisphere and continents. In such a short notice, nobody was prepared to tackle it. When it came to the attention of Public Health authorities, and to the hands of companies decision makers as they had at that time very little knowledge of the disease.

The agent itself was unknown, the dissemination was puzzling, transmission was unclear and the reservoir was unidentified. Epidemiologically, the incubation period was vague, thought to be of some days, and some rumours existed of 'superspreaders', able to contaminate a large number of other people. Clinically, the diagnosis was differential with other pulmonary infectious diseases, and no diagnostic means were available.

It is under these circumstances that companies running remote sites had to take decisions, and to implement SARS management policies. For the first time companies' management understood that national employees were not 'the risk' (i.e. African employees with viral hemorrhagic fever) but the non-nationals were (Filipinos, Canadians), bringing an uncontrollable disease in an unprepared environment.

Remoteness of offshore operations was not comparable, depending of their geographic location. For instance, the situation was indeed not comparable between those rigs located in the SARS transmission area, where everybody could have possibly been infected (i.e. offshore Vietnam), and those out of this area (i.e. offshore Africa), where contamination would have come from a rotator.

Remoteness increased the level of threat in terms of screening, diagnosis, treatment and evacuation. But in particular, it complicated the situation in terms of support:

- Information support: offshore medics had to be provided constantly with validated and referenced medical

information to counter false ideas and rumours. Additionally remoteness increased the possibility of misinterpretations interfering with the local context.

- **Operational support:** the implementation of SARS policies led to immediate need for provision of disposables (masks, gowns, etc.), which was complex during the crisis period (shortages, delays, etc.), and implementation of heavy procedures (screening, infection control, etc.).
- **Medical support:** there was a limited possibility to share doubts and concerns on the clinical management of cases. Medics experienced limitation because the only appropriate medical care was evacuation.
- **Psychological support:** everybody felt that in case a suspect case was identified on their site they would be 'trapped' and the support they could expect from topside would be limited. Furthermore, in case of outbreak on site, medical teams knew that the possibility of being replaced immediately was weak.

Based on these constraints, it appeared that the three main challenges in remote settings were to control the movements of staff, to be prepared for the management of suspected or probable SARS cases and to manage information and communication adequately.

### Controlling movements

With the very little information available at that time, controlling travel was the very first measure implemented. Risks were considered important because individuals came from all over the world, and lived in a close contact community. The density of population made possible close contact transmission.

**Travel management.** All companies with employees abroad issued travel restrictions to the outbreak area. This was in accordance with the recommendations of the international organisations such as the World Health Organisation (WHO) or the Centres for Disease Control (CDC). Various approaches were observed according to a given group. International travellers and rotators were advised to avoid stopping over or connecting in the transmission area airports. They were re-routed to non-infected destinations and other connecting flights. Rotators living in the endemic transmission area were believed potentially at risk of carrying the disease to the site. Some were asked to stay longer for their rotations. As a temporary decision some companies postponed between two to three weeks Rest & Recreation for Asian workers assigned in Africa, when it was unclear if screening measures in departing countries were effective.

Even if measures such as cancelling travels were evoked, companies did not apply them. Instead, screening and tracing were implemented early to allow rotations. In some operations in Africa, companies developed specific databases to manage individuals who were possibly infected during the 10 days incubation period. It allowed knowing who was at risk and who was not on a permanent basis.

**Screening procedures.** In order to make sure that travellers were not at the infectious stage of the disease, screening

measures were implemented rapidly, based on WHO recommendations. Thankfully measures such as temperature monitoring and respiratory symptoms checking were easy to put in place. On rigs, a medical officer at the helibase performed screening before embarking the helicopter. In remote sites, screening was performed by a medical officer ideally at the closest airport or at the main camp gate. The rationale was that for some employees, such as Filipino workers assigned in Africa, the travel time was up to 40 hours, largely enough to allow the apparition of symptoms.

To standardise the process, screening forms were developed based on the recommendations of the WHO: high fever above 38° C, pulmonary symptoms, and history of travel/residence in an area of transmission or close contact with a case. Forms were handed to the individuals and site management was given a copy once filled out.

Screening was also needed to access medical facilities. Procedures were set from the reception of patients to the management of patients' flow for large clinics and staff attire.

In order to assist companies in the screening of their employees, some assistance companies developed a SARS screening telephone hotline service. The principle was to manage the clearance to travel for employees, according to the company's own SARS Travel Policy. This policy defined permission to travel, requirement for not travel, requirement for confinement, clearance requirement to travel or return to work after confinement. Based on a telephone interview performed by a nurse or doctor, the caller was permitted to travel or was advised to follow the company's guidelines which included the following actions: stay at home, isolation or seek direct medical consultation.

This service was developed with an automated travel advisories program that gave employees up-to-date information about their destination and health risks such as SARS, and a traveller locator service that allowed companies to pinpoint immediately the location of employees worldwide if new SARS advisories were suddenly issued.

**Quarantine and isolation.** Quarantine was needed to isolate individuals who might have been contaminated, and who were susceptible to declare SARS. Some studies defined that quarantine could be limited to persons who had contact with an actively ill SARS patient. In China, among a group of 5,186 quarantined persons, only those who had a history of contact with a SARS patient acquired SARS (1).

In remote environment, the problem was mainly related to the technical feasibility of isolation in medical facilities which were unprepared for this scenario. The lack of space was the most important issue everywhere, from rigs to onshore clinics. Quarantine areas were identified in dedicated buildings or containers close to but distinct from the medical facility. As it was not possible to set such areas on-board rigs, quarantine areas were evoked to be onshore, in dedicated areas such as offices or local clinics.

Because these measures were linked, screening and quarantine implicated the necessity to write and to implement procedures. An isolation area was needed to care for the individual while a

quarantine area was needed to manage the contact cases of this patient.

Isolation of cases was possible only in large settings, where the medical facility was large and staffed enough to consider the initial management of a case. However, treating a case in such a facility would have paralysed it completely because it was not prepared for such outbreak. Companies had to consider a full screening, quarantine and isolation plan, addressing all these issues at the same time. For example, on a large construction project onshore and offshore West Africa, the scheme was to avoid the entry of cases in the project area, as a majority of employees were coming from the transmission area. The plan was organised in three steps, from the departure in Asia to the arrival in Africa, then to the site. Two screenings were planned, the first one the day before the departure, the second one at the arrival at the airport. This led to the identification of quarantine facilities and isolation treatment units at the departure and at the arrival points. Screening was to be performed by the project's medical staff in cooperation with the Ministry of Health's of the two countries. Different houses in towns were selected, and were to be equipped with treatment capabilities. Some companies also considered to have a medical team on stand-by in Europe to fly to any treatment facility in Africa in order to support the local medical team, and to prepare if possible a medical evacuation. A certificate was to be issued by screeners to allow the complete travel, and thermometers and leaflets were to be distributed to allow individuals to self-check and to make them responsible. Eventually the program was not implemented due to the end of the outbreak.

### Implementing SARS management measures

As the outbreak was ongoing, medical teams went from surprise to preparedness. In order to train them to the management of cases, different measures were taken.

**Alert level policies.** Some companies implemented at early stages an alert level policy to rank the type of recommendation and preparedness of a given site. Four levels were defined:

- Level 1 corresponding to a WHO / CDC global alert,
- Level 2 corresponding to a confirmed spread of SARS to the worksite country and confirmation of significant case fatality rate,
- Level 3 corresponding to a first probable case or first suspected case on site and/ or surrounding and confirmed significant case fatality rate,
- Level 4 corresponding to uncontrolled spread of SARS and multiple suspected cases from various areas of the worksite.

This policy helped the on site management of project's to prepare different response level scenarios.

**Triage procedures.** Most of the remote medical facilities were asked to implement the "Updated Interim Domestic Guidelines for Triage and Disposition of Patients who may have Severe Acute Respiratory Syndrome (SARS)" by the CDC (2). These guidelines aimed at structuring the identification of patients who may have SARS.

The difficulty was to adapt these procedures to the remote site environment where doing a differential diagnosis was more difficult due to the lack of diagnostic capabilities (poor laboratory support, no X-ray, etc.)

**SARS management kits.** In order to answer appropriately to a given alert level, some companies defined SARS mass response kits to be positioned on their rigs. The purpose of the kit was to give every individual on board disposables from the time a case was suspected to the evacuation off the rig and its disinfection.

These kits contained masks (surgical and N95), gloves, gowns and eye protection disposables, disinfectants, alcohol rubs and digital thermometers.

In larger settings, clinics were provided with additional stock of similar items for the medical team, and stock of masks for individuals.

**Infection control measures.** Infection control measures were reinforced and adapted to prepare the medical facility to the management of a suspect case. Several measures were taken, based on the experience of western standard hospitals (3):

- Emphasise basic clinic infection control policies such as hand washing,
- Procure Personal Protective Equipment (PPE) in sufficient quantity for medical staff and individuals potentially involved in the transportation of a suspected case (drivers, pilots, etc.). The PPE classically contained a set of gown, goggles and gloves. Eye protection was requested in patient care areas.
- Waste biohazard disposal bags were doubled to make sure that contamination would not be possible and proper incineration done.
- Standard Cleaning and Disinfection protocols were applied, as the virus was found sensitive to classical disinfection measures.
- Medical protocols, including nebulized medications, were banned.

**SARS case management.** In the event a case was suspected, the attitude was different according to the type and the size of operations. On board rigs, the common procedure was to evacuate the case as soon as possible while the patient could still be transported without respiratory distress. The sick bay could not manage him adequately medically, and as soon as he would have pulmonary insufficiency, it would have been impossible to move him to a reference medical facility.

In larger operations, the idea was to dedicate an area to manage a suspect case separate from the medical facility itself. The medical expertise and equipment were available to cope with pulmonary dysfunctions. However, this would have allowed a SARS case to be treated in an open facility, with all the risks of cross-contamination.

**Medical evacuation.** Remoteness would have complicated the medical evacuation process for several reasons:

Administrative authorisation might have been more difficult to obtain to move a case from a remote – and then isolated – facility to a reference hospital abroad, taking the risk of local transmission during the transfer.

Medically speaking, cases would have had to be transported during the very initial phase of the disease, without any major pulmonary dysfunctions.

Operationally, as remoteness increases the time of evacuation and the number of means of transportation, it would have limited the possibilities. Medical evacuation might have implicated more actors, from local transportation companies (helicopters for rigs, charter aircrafts for remote sites) to international class airports. In addition, non-SARS infectious cases would have been more difficult to evacuate due to the confusion they might have created alongside the SARS preparations.

Assistance companies gradually overcame these constraints. At the late stage of the outbreak some of them were even technically prepared for a regional medical evacuation of infectious patients in portable isolation units.

### Addressing information & communication

SARS crisis management would have probably not been possible without internet. This tool was relied upon heavily by medics and decision makers in remote environments who were eager to be updated permanently with validated information. Assistance and medical services companies were solicited to issue accredited information in order to be operationally translated. This ranged from the type and availability of recommended masks to the known incubation period. Internet and companies' intranets were used to disseminate information on the disease, its spread and its discoveries.

This information on SARS was also needed to educate employees on the reality and the evolving aspects of the disease, based on facts and figures and opposing rumours from the media. There was at that time a strong need for counter-power information from management because individuals, who easily connected to internet, relied more on media information than on the medic.

The challenge was to raise the attention of employees sufficiently not to panic them but to let them be aware of the disease and its patterns. Posters, leaflets, lectures and talks were set to educate employees. That was the only way to encourage them to report to their medical facility immediately after the onset of clinical symptoms.

It was also crucial to give accurate data to site managements for them to elaborate proximity messages understandable and acceptable by their community.

The main risks were; the lack of confidence in the medic and in the wide health system, the alteration of the risk perception and then inadequate precautionary measures taken. A survey performed during the peak of the outbreak in Hong Kong showed that respondents had numerous misconceptions and false beliefs about the routes of transmission of SARS despite heavy and constant mass media and public service announcement coverage (4).

Communication was important in both ways, from management to site and reciprocally, to decrease the remoteness. Most companies set regular conference calls between medical directors, topside support and on-site medical teams to comment any new information available, to discuss the SARS management policy and to share concerns.

### What have we learned?

Operating companies, assistance and medical services companies have learned a lot in this crisis, which can be summarized as follows:

- Clear case definition and criteria are important to help medical teams concentrate their efforts on real situations and not be saturated with false positive cases.
- Rapid information and clear communication from management and support services are vital for remote environment because they keep the medical team confident in its role.
- Tracing individuals who come to a remote site is decisive when it comes to know if they were potentially exposed to the disease during the previous days or weeks. Tracking systems, travel locators and travel databases are needed to focus measures on individuals at risk.
- Implementation of screening, quarantine, isolation and PPE were probably the most efficient measures to contain the disease, and mathematical models of the spread of SARS attempt to confirm it. However, as these measures affect the transmissibility of the disease, they possibly have to be applied above certain thresholds to be effective.

### Conclusion

In the absence of a vaccine, a robust diagnostic test and a specific treatment, this medical outbreak appeared initially to have no medical, but only operational answers. As such, SARS shocked many companies at the potential for global business disruption; it has raised the threat of global medical risks everywhere on earth. However, very few companies had emotive reactions, and most of the time decisions to implement a SARS management policy were made rapidly to cover all the changing aspects of the disease.

Realistically, one has to admit that most companies were fortunate because the probability of stopping activities due to a single suspect case was very high. In addition, everybody was more or less prepared for the management of one or few suspected cases and probable cases, but not for multiple cases, which would have probably been the most likely scenario.

Information on its characteristics and its management appeared to be crucial in remote settings to set a high degree of preparedness and to keep staff assured in their capabilities. One can say that rapid travel spread the disease, but rapid sharing of information contained it.

More than ever preparedness for such a situation must be addressed: remote sites need strong decision-making support. They need to be provided with sets of infectious disease management kits, ruled by protocols and policies. The likelihood for some viral hemorrhagic fever cases from a traveller on a rig, or a major influenza or other pandemic on a site project cannot be ruled out anymore. A simple measure such as flu vaccination to eliminate differential diagnosis can be the first step of this comprehensive approach (5).

Quarantine, screening, isolation and PPE must be planned: would it be possible on the site, or in an outside local facility designated in advance? Will it be legally possible? Which stock of equipment would have been appropriate? What would have been the attitude with national employees?

In addition, various questions remain unclear because no real cases occurred: How would the site host country have reacted in a SARS case? Would evacuation abroad have been possible? Who would have been allowed to be evacuated? Where would quarantine have been possible?

The need for companies operating in remote areas to address this issue globally and to prepare a full infectious disease management policy is now urgent. This outbreak is a reminder for companies' medical management that its duty of care is to ensure that procedures to maximize the safety of frontline medical teams are instituted and those of employees preserved (6).

### Acknowledgments

The author would like to thank the on-site chief medical officers who helped him to structure this reflexion exercise based on their experience. Cynthia Graffio and Christophe Souletie are thanked for their thorough review of the article.

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