

ค. สรุปแผนป้องกัน ควบคุม และตอบสนองการรั่วไหลของน้ำมัน และการเก็บกวาด
คราบน้ำมัน

ภาคผนวก ค

สรุปแผนป้องกัน ควบคุม และตอบสนองการแพร่ระบาดของ
ของน้ำมัน และการเก็บกวาดคราบน้ำมัน

INTRODUCTION

The Unocal Thailand's Oil Spill Response Plan is an integral part of the Unocal Thailand Emergency Procedures and 24/7 Emergency Response Organization. Details and Guidance are incorporated in this Spill Prevention Control and Countermeasure (SPCC) manual which is designed to provide specific technical and organizational information related to oil and other material spills.

If a spill occurs, the on-scene “person in charge” [Offshore Installation Manager (OIM), Drill Site Manager (DSM), Senior Person In Charge (SPIC)] is responsible for coordinating the immediate response utilizing on-scene resources and personnel along with neighboring facility resources and personnel. If further support is required, the Unocal Thailand Asset or Department Duty Coordinator would request the Bangkok Incident Commander to establish the Bangkok Emergency Control Center (ECC) at Unocal Thailand's Bangkok offices, staffed by the weekly 24/7 duty roster personnel (Figure 1).

SPILL CLASSIFICATION

Unocal Thailand recognizes and subscribes to the 3-Tier approach to oil spill response accepted by government and industry. The tiers represent oil spill response categories, with the size of an oil spill and the required response as listed below.

- Tier 1** A small sized spill of less than 150 Barrels (< 20 tons) that will remain localized and that on-scene (spill source site) equipment, resources and personnel can respond to and control
- Tier 2** A medium sized spill of between 150 and 3700 Barrels (20 – 500 tons) that will require the joint effort of both on-scene and in-country equipment, resources and personnel
- Tier 3** A large sized or on-going spill of greater than 3700 Barrels (> 500 tons) that will require response efforts of on-scene, in-country and out of country equipment, resources and personnel



Figure C-1 Photo of the Emergency Control Center at Unocal Thailand's headquarters in Bangkok.

OIL SPILL PREVENTION

Unocal Thailand emphasizes proactive prevention as being fundamental to the company's ISO 14001 certified Environmental Management Systems.

Proactive prevention of oil spills begins with mandatory hazard and operability (HAZOP) studies of all new projects to identify and address potential risks and mitigation plans.

Resulting HAZOP mitigation and emergency plans focus on ensuring the following three key aspects of response are in place prior to an incident.

- Defined organization and responsibilities
- Communications
- Resources

Unocal Thailand's emphasis on prevention is characterized by the Spill Prevention, Control and Countermeasures Manual, which can be considered synonymous and inclusive of Unocal Thailand's Oil Spill Response Plan.

Prevention of spills is fundamental and is based on using proven industry practices, design methods, equipment specifications and selection, to achieve best available technology consistent with economic viability.

OIL SPILL MITIGATION PROCEDURES

For both the Platong Oil Development Project Phase 1 and Phase 2, practices and methods such as the following have been implemented to mitigate the risk of an oil spill.

- During drilling, extra well management and drilling procedures have been addressed based on the identified environmental aspects and lessons learned from the 20 years of operating experience in the Gulf of Thailand.
- Deck design and drain systems have been designed to contain and recover oil that enters the systems and to prevent oil from being discharged overboard.
- A produced water treatment system is provided to treat water prior to discharge to ensure a maximum practical removal of total petroleum hydrocarbons.
- The sub-sea pipeline between the PLOCPP and the PLSPM (SPM3) is an 8-inch steel pipe with an insulated void and secondary 12-inch outside steel jacket providing a double jacket configuration.
- Details of the Unocal Thailand Emergency Procedures, Organization and SPCC manual (covering oil spill prevention and response procedures) have been considered as part of this EIA.
- A bi-directional auto shut off coupling was installed on the hose between the SPM3 and PLFSO along with a Hawser Load. Line-monitoring instrumentation with alarm functions are provided on the PLFSO.
- A pan and tilt CCTV system is provided at the bow of the PLFSO to monitor the hose between the SPM3 and PLFSO and the Hawser integrity.
- The SPM3 to PLFSO hose is double jacketed with warning lights that monitor the void between the jackets to ensure integrity.
- The SPM3 is provided with a gas detection and alarm system to warn of a leak in the SPM3.
- A marine tug will be in full-time attendance at the PLFSO.

- Unocal Thailand has established a logistics mutual aid agreement with Chevron Offshore Limited Thailand, which allows the sharing of marine, aircraft, and other resources during emergencies.
- Unocal Thailand has established an oil-spill response contract with ORST of Singapore to provide more extensive equipment and response capabilities to supplement the in-country equipment described above.

OIL SPILL RESPONSE TRAINING

Organizational and personnel skills are also basic to operational excellence and emergency response. Unocal Thailand's proactive environmental management systems are designed to provide training consistent with the needs and responsibilities of each person as well as refresher training courses to maintain competency. This training is coordinated by Unocal Thailand's Organizational Development Department utilizing Unocal Thailand's physical training facilities in Bangkok and Songkhla, as well as on-the-job training.

Initial and refresher training in Environmental Awareness has been initiated as part of the ISO 14001 management system to ensure all personnel understand their roles and responsibilities in environmental protection.

Specific training courses related to Oil Spill Response include:

- Marine and Helicopter Transportation and Sea Survival
- Fire Fighting and Emergency Response
- Hazardous Materials Awareness and Communication (HAZCOM)
- Hazardous Materials Response and Handling (HAZMAT)
- Oil and Chemical Spill Response Operations (IMO)
- Waste Transportation and Manifesting (IMDG and IATA)
- Decontamination and Disposal Practices (HAZMAT+)
- 20 Unocal personnel have completed IMO spill response training.
- 12 personnel have completed drills on boom and skimmer deployment and operation of the on-scene Tier 1 equipment. Ongoing training is planned to maintain competency.

- 17 personnel have completed “on boat” dispersant spray equipment operations training. Ongoing training is planned to maintain competency.

EMERGENCY COMMUNICATIONS NETWORK

With communications being a key component of emergency and spill response, Unocal Thailand's in-house Information Technology (IT) Group provides and maintains an extensive and redundant day-to-day network of communication facilities to provide voice, data, fax and e-mail correspondence to and from Bangkok, Songkhla, Offshore facilities, and internationally utilizing land, satellite and radio links. It is anticipated that during a spill limited additional communication facilities would be required. This network also provides access to Unocal's internal Intranet and the worldwide Internet from all facilities. All onshore and offshore facilities have emergency electric generators and UPS power to ensure reliable communications during primary power supply outages.

OIL SPILL RESPONSE RESOURCES

Having resources available is the third key element of emergency and oil spill response. To achieve this, Unocal Thailand's immediately available personnel and logistical resources include:

1. Unocal Thailand's 20 plus years of operational experience and the in-place infrastructure including more than 800 operations and technical personnel offshore in the Gulf of Thailand 24/7 along with more that 200 management and technical personnel in Bangkok. This includes specialists in Engineering, Health and Environmental Safety (HES), Public Relations, Marine Operations, and other operating disciplines essential to oil and gas operations.
2. Radio rooms staffed 24/7 at Bangkok, Songkhla and six offshore field locations
3. An offshore weather station with weather radar.
4. Day-to-day marine, aviation, and logistic support that includes the Unocal Thailand Songkhla Marine Base and Aviation Center with the following combined capabilities:
 - 80 purchasing, procurement and logistics personnel in Bangkok and Songkhla.
 - Marine cargo movement capability of 1000 tons per day

- One 70-ton rated dockside mobile crane (15-ton effective dock to boat capacity)
 - Three semi tractor trailers, five pick-up trucks, four personnel vans
 - Five Supply Boats, 520-1556 Ton (DWT) (location and duty available from the daily marine report sent to all facilities, including Bangkok)
 - Nine Crew Boats, 33.3 m length, 7.8 m beam (location and duty available on daily marine report sent to all facilities, including Bangkok)
 - Two Bureau Veritas classed 45.7 m x 15.2 m deck cargo barges
 - Significant stocks of primary consumables. Safety and personal protective equipment are held at Unocal Thailand's Songkhla warehouse, where staff available to dispatch equipment 24/7
 - One Sikorsky S61N 26-passenger Helicopter, available 24/7
 - Two Sikorsky S76 12-passenger Helicopters, available 24/7
 - 200 tons of offshore diesel fuel available on Erawan FSO (minimum storage)
 - 15,000 liters Jet-A1 fuel available offshore at various facilities (minimum storage)
 - 15,000 liters Jet-A1 fuel available at Songkhla Air Center (minimum storage).
5. Specific offshore oil spill response resources available to Unocal Thailand include:
- Two Offshore/On-site Tier 1 Supply Boat Deployable Recovery Systems
 - Two Tier 1 Recovery Systems available on a shared basis under a Mutual Aid Agreement with Chevron Offshore Limited Thailand
 - Two Offshore/On-site Boat Deployable Dispersant Spray Systems.

- 10,000 liters of Nalco/Exxon EC9500A dispersant are available offshore
- A 24/7 Response Contract with Oil Spill Response Thailand (OSRT) Bangkok/Sattahip to provide personnel and equipment for Tier 1 and Tier 2 response from their Sattahip Base and their affiliate National Response Corporation's worldwide spill equipment and personnel inventory. Response time 2-48 hours. More information can be found at:

IEM/OSRT: <http://www.iem-thai.com/consultant-osrs.htm>

NRC: <http://www.nrcc.com>

- A 24/7 Response Management Contract with ERST/O'Brien's Inc. of Brea, California, USA to provide spill management personnel for immediate to long term oil spill response efforts. ERST employees and the company were formerly part of Unocal, so the ERST personnel are very familiar with Unocal Thailand's operations and people. Response time 24-48 hours. More information can be found at: ERST: <http://www.erstobriens.com>
- 24/7 Response Contract with East Asia Response Pte., Ltd. (EARL) Singapore to provide equipment and personnel for Tier 2-3 response from their Singapore Base, with back supplies and personnel from their Alliance Partner Oil Spill Response Limited (OSRL) of the UK. (Unocal is a charter and ownership partner of OSRL) Response time 24-48 hours. More information can be found at:

EARL: <http://www.earl.con.sg>

OSRL: <http://www.oilspillresponse.com>

In overall consideration, Unocal Thailand is quite proud of the flexibility, effectiveness, and responsiveness of their Emergency Procedures, Organization, Communications, Resources and particularly the ability of the Unocal personnel to respond to emergency situations, even outside Unocal's oil and gas operations. This was demonstrated by the extensive support and operations provided to the Songkhla Province during the year 2000, Hat Yat Area flood.

PERSONNEL TRAINING FOR UNOCAL THAILAND'S OVER-ALL EMERGENCY PROCEDURES

The following is a general orientation and summary of Unocal Thailand's over-all Emergency Procedures and Planning that have been in place and under constant improvement for more than 20 years.

As part of the mandatory Employee Orientation, new employees are informed about each Unocal Thailand facility having a posted "Emergency Station Bill" that details how personnel are alerted to an emergency and the actions to be taken during an emergency. The Emergency Station Bill also assigns personnel to emergency positions (key individuals) by job classification. (The Emergency Procedures Manual for each facility contains a checklist of actions to be considered for each person assigned to each key Emergency Position.)

Additionally, each Unocal Thailand facility has a posted Emergency Equipment Layout Diagram to alert all personnel of the hazards present and the location and availability of emergency and personal protective equipment.

Bangkok and Songkhla personnel that will be assigned to be "on call" are informed about the weekly Duty Roster which assigns Unocal Thailand Bangkok and Songkhla staff to 24/7 emergency duties requiring them to be "on call" so they can be alerted of an emergency by telephone, pager or cell phone.

Personnel are instructed during formal training to become familiar with each manual by reviewing all of the sections, then reviewing the Emergency Organization and the Checklists for the various emergency positions so they understand and are familiar with the arrangement and materials of each manual. The SPCC manual provides the technical information for Spill Response as part of the overall emergency procedures.

When a person's job function is identified as a "key individual" or if they are assigned a Duty Roster Position, they are required to obtain a copy of their Checklist and have it posted or readily available at their normal work location or Emergency Station. If necessary they are instructed to keep a copy on their person at all times while on call.

When a person's job function is not specifically identified as a "key individual", they are instructed to consult their facilities Emergency Station Bill and to know what their responsibility is or what they should do if an emergency or spill arises.

EMERGENCY RESPONSE MANUALS

The Unocal Thailand Emergency Procedures Manuals (EPMs) and SPCC Manuals are arranged in two parts. The sections of Part I provide specific details on the responsibilities of the key individuals and provide resource guidance that may be helpful during an incident, e.g., telephone directory references, details or forms with guidance on required notifications and reporting, and the Unocal Thailand Emergency Organization provided in a condensed format. The sections of the EPMs are divided with tabs for easy reference.

The Checklists of Part I of the Manuals are at the heart of the procedure as they provide a systematic approach to the actions necessary during an emergency or spill. The basic premise is that, if each key person follows their Checklist, most necessary activities will be considered and performed without a duplication of effort. There are, however, items within the Checklists to confirm important actions or to "coach" another key individual. This is to ensure no actions are overlooked and they are designed to be a double check, not a duplication of effort.

Each numbered line of the Checklist is a brief action statement designed to refresh the person's memory about a particular action. Each statement should be considered for its applicability then either performed if the action is relevant to the present emergency or skipped and the action on the next line is then carried out.

Personnel are trained to understand that it is important during drills and incidents to review the Checklists periodically from top to bottom along with their notes and to constantly re-evaluate the situation.

Of course the Checklists cannot foresee all eventualities and nothing will substitute for common sense, training and experience.

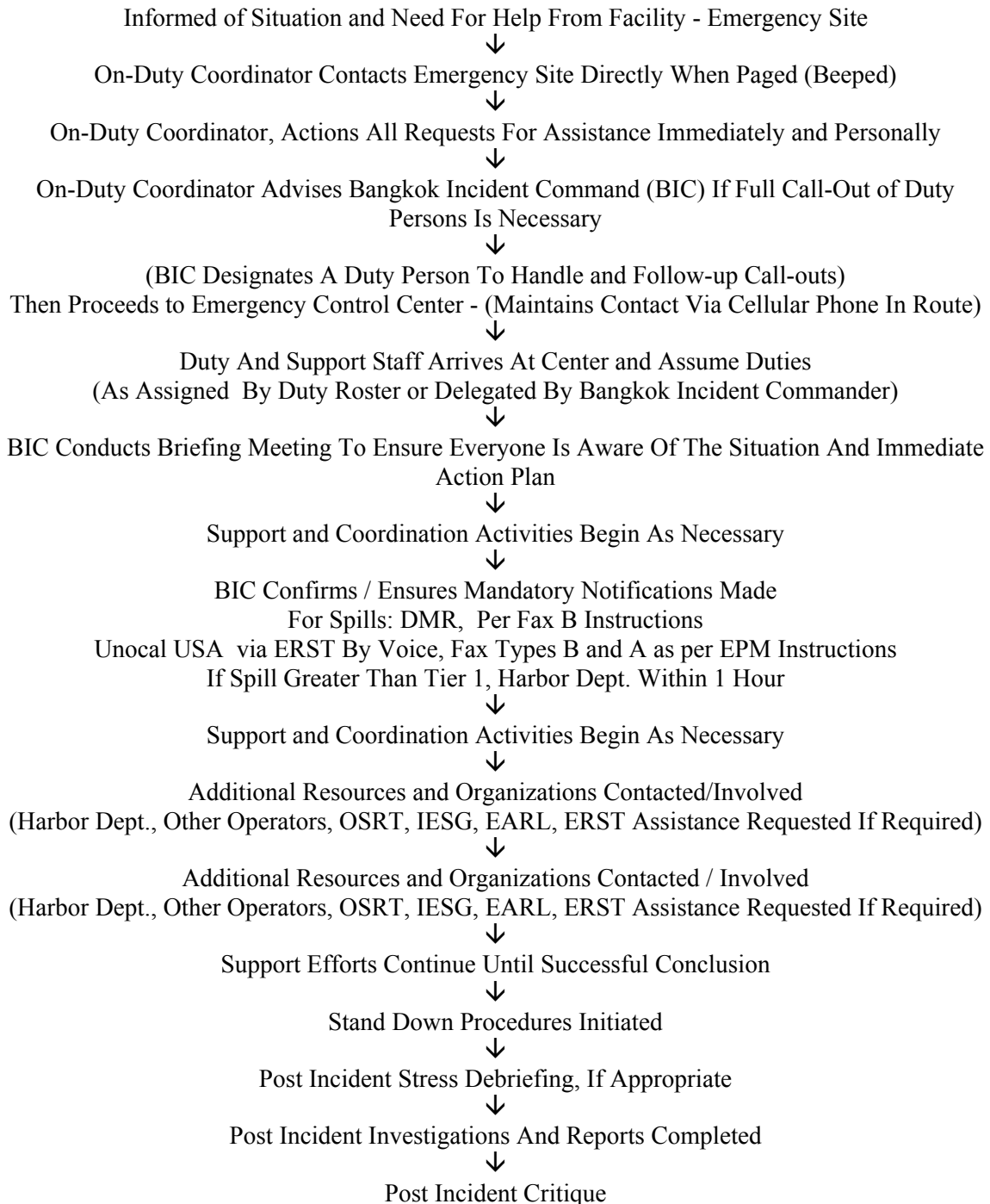
In all cases, the written procedures are only guidelines and employees are instructed to act or seek advice and then exercise their best judgment based on the conditions and situation at the time.

Emergency Drill Report Forms for spill response are located in the Training Exercises Section of the Emergency Procedures Manuals. These are designed to aid in planning training exercises and drills. The forms are completed and distributed after each training drill or exercise to benefit from the lessons learned.

Personnel are reminded that emergencies are best handled by the best and most qualified personnel on the scene. However, it is appropriate at any stage (by agreement and at the appropriate time) for personnel to relinquish their role to a more qualified person or for the Bangkok Incident Commander to assume the overall command consistent with the situation at the time.

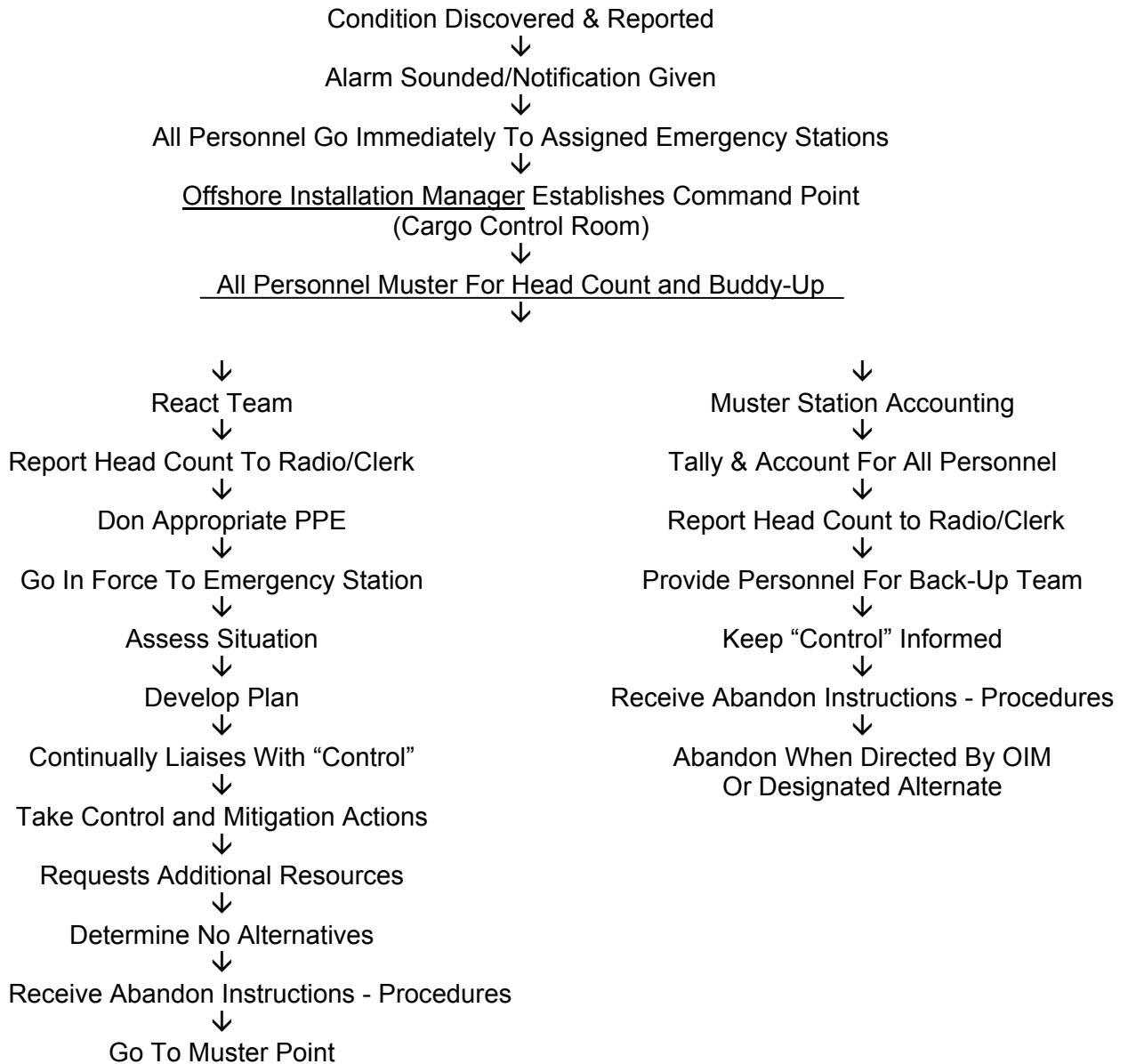
The following pages provide a summary of the emergency action plans of personnel at various facilities.

BKK / SKL Duty Persons & Control Center Actions:

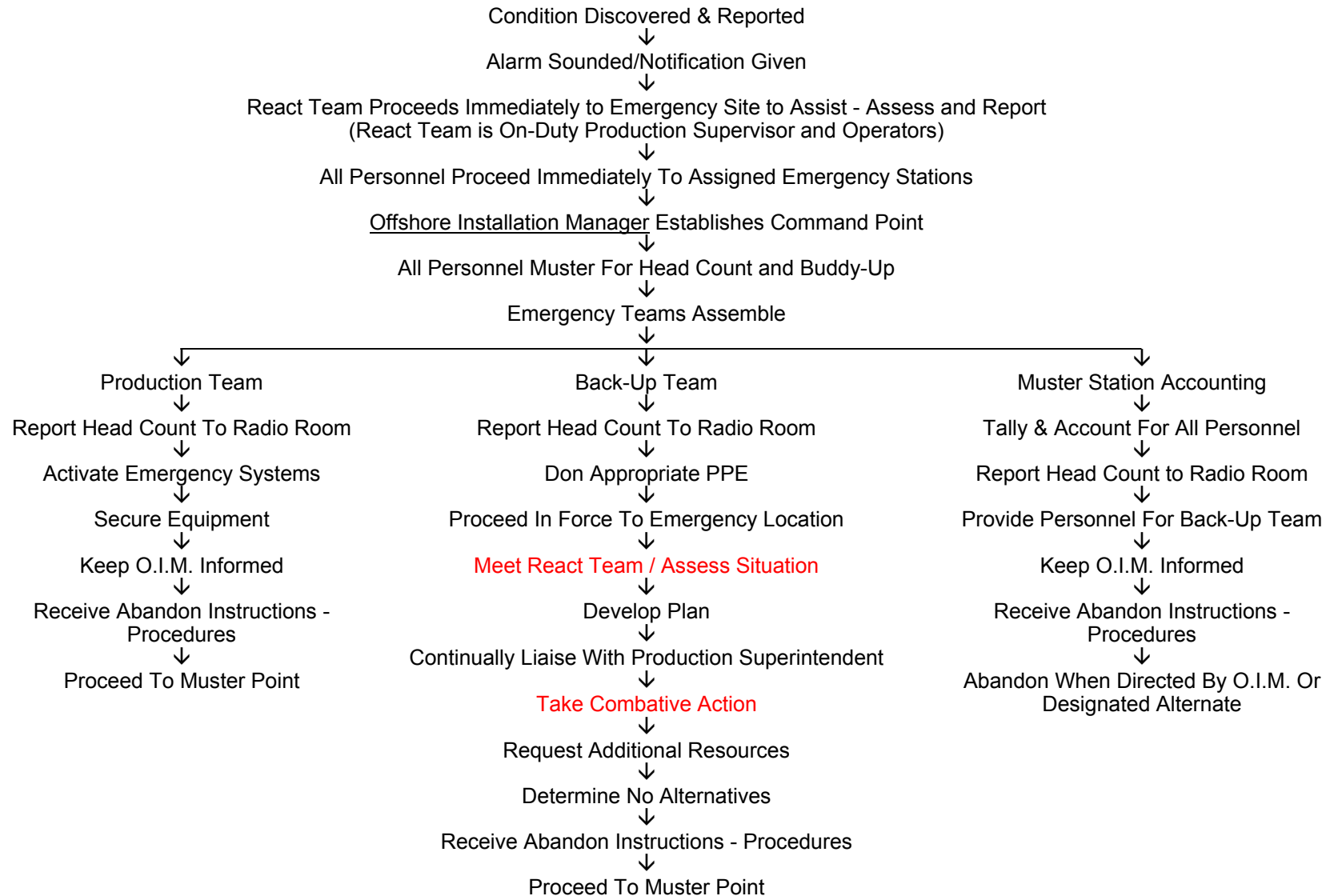


Throughout this Manual, the Offshore Installation Manager (OIM), Unocal Drill Site Manager (DSM), Unocal Company Representative (UCR) or Facility Manager can be considered synonymous as the person-in-charge as appropriate for the Facility Operation.

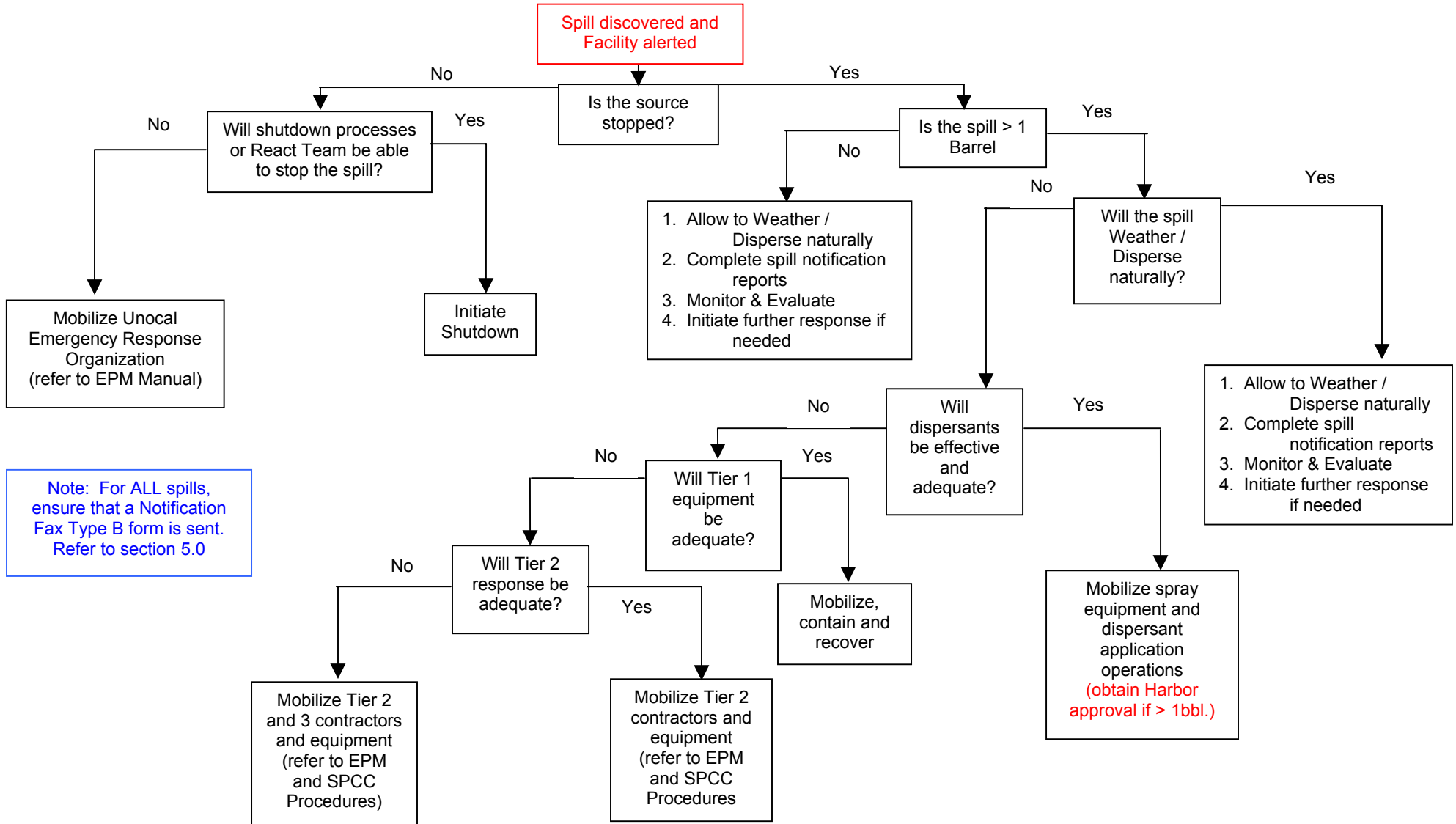
FSO EMERGENCY
Simplified Emergency Response Action Chart



PRODUCTION FACILITY
Simplified Emergency Response Action Chart



Schematic of Emergency Procedures Response to an Oil Spill



Note: For ALL spills, ensure that a Notification Fax Type B form is sent. Refer to section 5.0