

ANNEX 13: CONTINGENCY PLAN

ENERGEAN OIL & GAS

KAVALA OIL S.A.

EXPLORATION AND EXPLOITATION OF HYDROCARBONS



CONTINGENCY PLAN

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SECTION A SCOPE - CLASSIFICATION

1. Scope

This Contingency Plan covers the organization and actions to be taken during emergencies in the Offshore and Onshore facilities, during operations and construction phase of the Prinos development plan including the installation of the new platforms, Lamda and Omicron, and the submarine pipelines and umbilicals.

Emergencies are defined as injuries, pollution and damage to facilities.

It is the responsibility of the company to do everything possible to provide a safe working environment for its employees and minimize the possibility of causing damage or injuries to third parties.

It is also the responsibility of each employee to perform his / her assigned duties so as not to expose himself, other persons, or the property of the company or others to potential danger.

Despite of this, it is recognized that the possibility of unplanned incidents exists and the company has developed a series of action plans to handle and control contingencies within its operations.

This contingency plan outlines a course of action for the mobilization of personnel and equipment that may be required to handle a serious emergency. The system may result in some cases in over reaction, but this must be accepted.

The contingency plan for its success depends on the complete, prompt and willing co-operation of all designated persons involved. In carrying out these procedures, all staff should bear in mind that the objective is to secure a speedy return to safe and normal operations. In order to achieve this, normal chains of command may be disrupted and unusual working conditions be accepted.

2. Classification of Incidents

Incidents have been classified into three main categories:

1. Incidents involving injury to personnel
2. Incidents involving damage to facilities
3. Incidents involving pollution

In general, to cope with each category will require a different total reaction involving different people, different kinds of work and a different organization structure.

By classifying the incident, it will be possible to notify the maximum number of people in the shortest period of time so that they can take appropriate quick action.

On the basis of severity the incidents are further classified into MINOR and MAJOR incidents:

MINOR incidents are those which can be adequately controlled using the plant or platform facilities.

MAJOR incidents are those which require additional support, immediate assistance from outside, emergency shutdown, immediate evacuation or medical assistance.

2.1 Incidents involving injury to personnel

MINOR Injuries in this category are minor cuts or bruises, which can be dealt with using the first aid station or first aid boxes of the facilities.

MAJOR Injuries in this category include:

- All injuries requiring evacuation and outside assistance
- All cases of H₂S poisoning
- Fatal accidents
- All multiple incidents of H₂S poisoning
- All incidents involving loss of personnel overboard from the platforms or vessels
- All serious injuries resulting from failure of plant or equipment.

2.2 Incidents involving damage to facilities or construction sites

- MINOR** Damage that does not affect normal operations or construction activities and does not present a potential hazard. Damage that can be repaired without additional assistance. Small fires which can be extinguished with a mobile fire extinguisher or a fire hose.
- MAJOR** Uncontrolled fire - well blow-out. Major damage to structures. Rupture (with or without explosion) of major vessels. Evacuation of production platforms or rigs. Earthquake or major storm damage. Pipeline break or rupture.

However, it is recognized that any incident may include one, two or all three of the types listed above. When this situation occurs priority action will be directed towards preservation of life and the prevention of injury by the appropriate area Superintendents.

2.3 Incidents involving pollution

- MINOR** Small spills of substances that will naturally disperse or settle or quantities of oil less than 7 tn. Minor escapes of gas, accidental discharge overboard from platforms or vessel of debris or refuse.
- MAJOR** Onshore this covers all escapes of potentially harmful liquids gases or solids outside the boundaries of the company installation or the construction site. Offshore this category covers all cases where potentially harmful liquids, gases or solids are discharged to the atmosphere or the sea from platforms, submarine pipelines or during the construction phase. This category also includes cases where emergency shutdown of equipment failure causes flare emissions to rise above permitted levels.

SECTION B PLAN IMPLEMENTATION – ORGANIZATION

1. Plan activation

Supervisory control of a major incident is as shown in Appendix B.1. This will apply to all major incidents in any of Energean's facilities and activities during Prinos development and operations including construction sites. Detailed organization, functions and duties are set out below.

The most knowledgeable person and the person most familiar with the incident and knowing all pertinent details is the Area Superintendent in charge of the area affected by the incident. Therefore, the Area Superintendent will be the Site Director in full charge of evaluations, decisions, and work direction at the incident site.

If the Area Superintendent, now acting as Site Director (SD), or his designated alternate determines that major incident is in progress or is likely to become a major incident, he will declare a major incident to be in progress, implement the current Contingency Plan and take all the immediate steps required to contain and minimize the incident and prevent personnel injuries and equipment damages. He will promptly activate the Site Center as close to the incident site as safe and practical.

2. Site Center

2.1 General

The exact personnel and equipment required at the Site Center will be determined and designated by the Site Director after evaluating the incident on site. The company environmental technician will be asked to obtain samples and data, in most of the cases.

The Site Center is located as close to the incident site as safe and practical.

The Site Center is manned and operates 24 hours until the incident is over and the situation restored back to normal.

2.2 Site Center Responsibilities and Authorities

The Site Center will assess the situation on the spot and make immediate evaluations on what is required to best resolve the incident with the minimum risks to personnel, equipment and environment. All of the efforts of this group will be directed toward safe containment of the incident and final restoration.

To plan and manage the required on site activities to accomplish the above.

To determine the extent, type of support required, timing and the absolute priority of each type of support.

To gather, analyse, record and communicate incident data to Coordination Center.

All data are to be recorded and promptly communicated to the Coordination Center in order to minimize communications. Following this assumption, maximum cooperation from supporting groups is required.

Unnecessary communications with the site of the incident should be avoided.

2.3 Site Director

After evaluating the incident data, he determines an incident as major incident in progress and immediately implements the current Contingency Plan.

He assumes full, sole and absolute authority and directs all work and efforts required to minimize and resolve the incident with minimum risk to personnel and in the shortest time consistent with good safety practices.

He evaluates on site the necessary requirements to restore the incident with minimum risk to personnel, equipment and environment, in the shortest time period practical and with maximum safety.

He has the authority to order any equipment or specialized personnel to expedite the restoration of the problem either from company resources or outsourced.

He records and communicates on a timely and continuing basis all relevant data to the Coordination Director.

He directs and controls all personnel and work at the incident site.

He evaluates the amount and type of support required; the timing of such support and the priority of each type of support and communicates this to the Coordination Director.

He determines when the major incident is over and officially states that by communicating immediately with the Coordination Director. Normal lines of authority will afterwards be restored.

He assists the designated committee in the investigation of the incident, in order to prepare all reports required by the company Management and the Authorities.

He also submits recommendations for appropriate future action to minimize such incidents and to most efficiently restore them in case of reoccurrence. The Managing Director defines the investigation committee.

The Site Director can be replaced (e.g. due to injury or fatigue etc.) by the Coordination Director with the agreement of the Managing Director.

The Site Director after quickly assessing an incident communicates with the Coordination Director and asks him to activate the Coordination Center, as soon as possible.

3. Coordination Center

3.1 General

The staff and equipment required will be defined by the Coordination Director based on the type of the incident and all available information.

The Coordination Center (CC) is located at the Conference Room of the main office building.

The CC is manned 24 hours and operates until the incident is officially over.

The CC will provide assistance and consultation to the Site Centre in order to maximize the manpower application at the incident site to the job of containment and resolution of the incident.

The CC will be directed by the Coordination Director (CD).

Only those persons whose duties require their presence will enter the CC during an emergency.

Switchboard operators (Guard House) will be instructed to "filter" incoming calls and connect only those requiring immediate attention.

3.2 Coordination Center Responsibilities and Authorities

Provides to the incident site personnel an one-point contact, gives and receives data, obtains necessary technical assistance, consultation, and insures coordinated and expedited actions on required procedures, material, and/or personnel and other urgent needs.

Provides immediate contact with outside resources and experts required to resolve the incident.

Assures follow up and expedites critical equipment's' and personnel's arrival to the incident area.

Coordinates overall activities of various groups that are necessary for the most effective restoration of the incident.

Ensures communication of accurate information to all involved personnel, to higher management and finally to the Board of Directors.

Ensures coordinated and correct transmission of data to the authorities.

3.3 Coordination Director

When informed by the Site Director that a potential major incident occurred, the Coordination Director immediately activates the Coordination Center.

He assumes overall responsibility for coordination and is authorized to take all necessary actions to support the restoration of the incident.

He informs the Managing Director, who promptly informs all local authorities and the Board of Directors.

He keeps the management continuously informed on current status and defines all necessary plans for action.

He cooperates with the State bodies and Local Authorities to ensure full and effective use of all resources.

He authorizes and mobilizes outside assistance as required and is empowered to enter into verbal agreements with Third Parties regarding the major incident restoration.

He ensures that full and detailed records are kept.

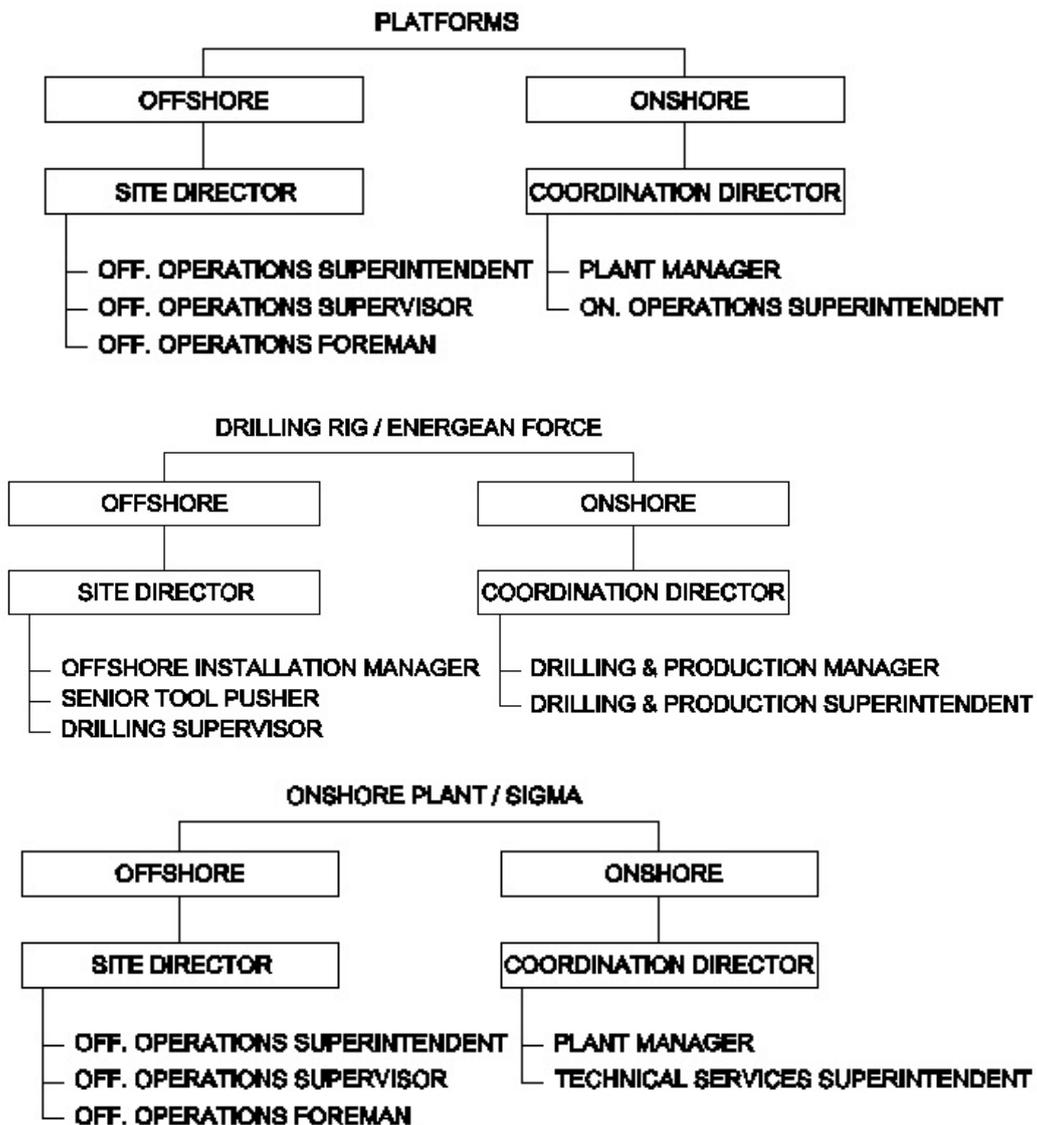
The HSE and the Technical Services Dept. are in all cases available to provide any assistance to the Site Director and / or to the Coordination Director as needed.

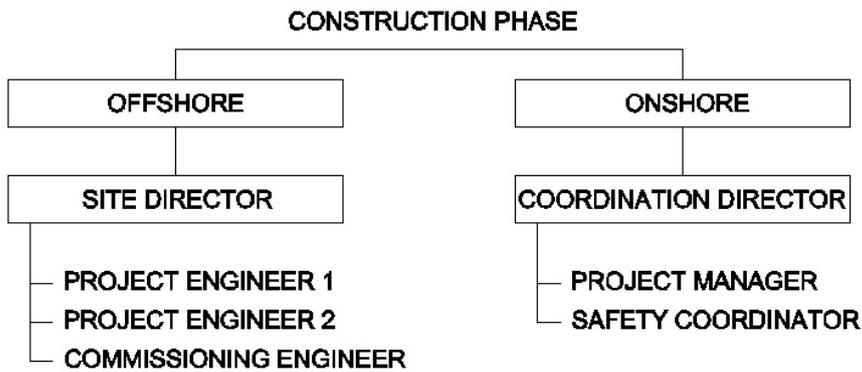
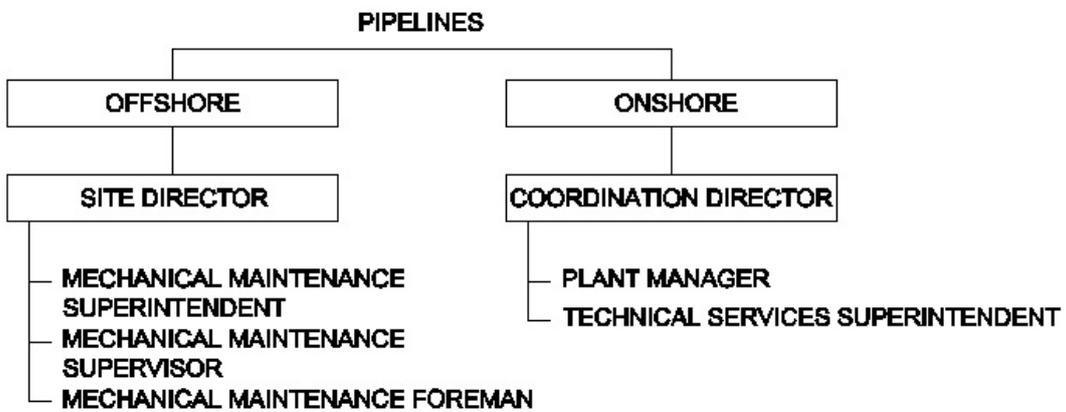
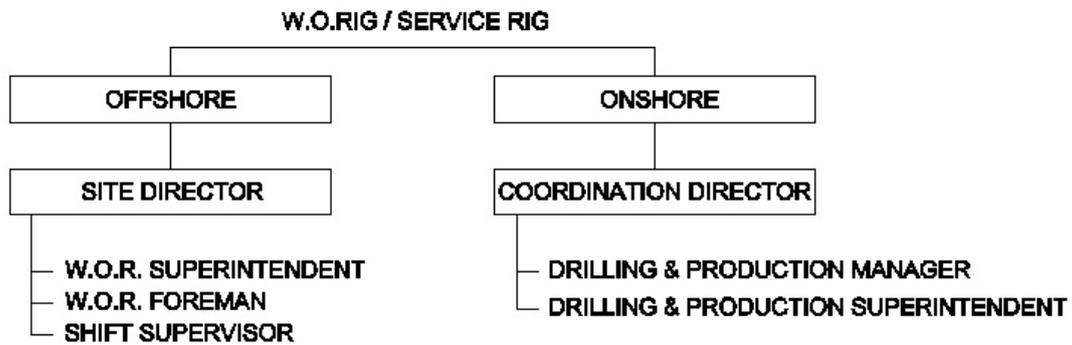
3.4 Managing Director

The Managing Director will be available at or through the Coordination Center for consultation and support actions as required and will be kept fully informed by the Coordination Director at all times.

Under very unusual and exceptional circumstances, the Managing Director, upon written instructions, may find it necessary to assume full direction of the incident.

APPENDIX B.1 SUPERVISORY ASSIGNMENT LIST





SECTION C MINOR INCIDENTS

1. Minor Injuries

Minor injuries may occur while travelling to and from work or while working offshore and onshore, at drilling, operations or construction sites.

After first aid treatment, the supervisor ensures that the injured person is capable of continuing his duties. If in doubt he asks for medical assistance or medivacs the injured person to Kavala Hospital.

As soon as practical after the incident, the supervisor of the injured person completes an INCIDENT REPORT FORM and forwards it to associated persons.

Corrective actions are taken as necessary. Reports are regularly reviewed to prohibit reoccurrence.

2. Minor Damage to Facilities

The supervisor estimates whether a potential damage can be repaired internally and whether a potential fire can be put out successfully by the on duty personnel.

Immediate action is considered essential to prevent the escalation to a major incident.

All incidents are recorded and the Supervisor issues a damage report, describing the action for protecting personnel and / or repairing equipment. The report is sent to the Technical Services via the area Superintendent with a copy to the Maintenance Superintendent, Plant Manager, HSE Manager and Managing Director.

3. Minor Pollution

3.1. Crude Oil

Immediate action is taken to identify and stop the source of pollution while at the same time clean up action is initiated.

Floating and absorbent booms, absorbent materials and oil skimmers are used to fight even minor spills as described in section F.

3.2. Gas releases

Immediate action is taken to identify and stop the source of the leakage. An extensive inspection is made to ensure that all hazards are eliminated.

3.3. Refuse and solid debris

Effort is made to recover floating debris accidentally fall overboard of the platforms.

Environmental induction is included in the annual training sessions in order to promote employees' environmental sense and to prevent throwing of refuse, hydrocarbons or any other type pollutant overboard.

A pollution report is issued, describing the circumstances led to the incident, the action taken to prevent recurrence and clean up measures taken. The report is forwarded to the Technical Services and is reviewed during the regular safety meetings. A copy is sent to the Plant Manager, Managing Director, Administration and Finance Services Manager and the HSE Manager.

SECTION D MAJOR INJURIES

1. Hydrogen Sulfide Poisoning

The prompt and methodical action in all cases of H₂S poisoning is very important.

Before attempting to rescue a person poisoned by H₂S, potential rescuers don their own breathing apparatus and mask up.

On transfer to a cleaner environment, resuscitation is commenced with minimum delay. Resuscitation continues until the patient either resumes breathing or transferred to Kavala Hospital. Automatic external defibrillation is applied continuously to support heart operation.

In all cases after basic life support the patients are transferred to Kavala Hospital for full recovery.

2. Multiple incidents of hydrogen sulfide poisoning

Where more than one person is involved in an incident of H₂S poisoning without fatalities, the following procedure is applied:

After providing First Aid and supporting of life the Area Supervisor informs the Guard House / switchboard about the incident and asks for assistance. The Guard House / switchboard personnel arrange for transportation and medical assistance and call the Emergency Response Team.

The Area Superintendent informs the Coordination Director and makes a site inspection. He secures all Breathing Apparatus or portable gas detectors that have been used in the incident for further examination. He also ensures safe conditions for restarting operations. He keeps contact with the Coordination Director until the situation returns to normal.

The Coordination Director instructs the Administration and Finance Services Manager to inform Local Authorities about the incident, and arranges for back-up assistance if necessary.

If other factors are involved (damage, pollution) further action is taken according to impacts.

3. Major Injuries Resulting from Equipment Failure

In the event of serious injury occurring as a result of equipment failure, the equipment is not used, repaired or recommissioned until the incident has been investigated.

In case of such failures, the Area Supervisor after providing rescue, first aid and restoring the safety in the area informs the Area Superintendent who is responsible to inform the Area Manager.

The Area Manager, Area Superintendent, Maintenance Superintendent and Safety engineer will personally inspect the accident area and obtain all pertinent information, which will help to identify the cause.

In case the equipment involved is certified (i.e. pressure vessels, cranes, etc.) it should also be left untouched as long as possible, pending inspection by the certifying authority. In case it is necessary to move the equipment, photographs and/or diagrams shall be made in order to assist the investigation.

No part of the failed certified equipment would be used or decommissioned until approval has been obtained from the certifying authority.

After initial investigation, the Area Manager and the Area Superintendent immediately brief the Coordination Director and the Managing Director to the extent of the damage and possible implications for continued safe operations and production.

4. Transportation of the Injured Person to the Hospital

4.1. Onshore facilities

- During Office working hours:
- The Supervisor of the injured person assures that the injured person (IP) receives first aid treatment and informs the department's superintendent, the Plant Manager and the Safety Department.
 - The Supervisor evaluates the condition of the IP and how he will be transported to the Hospital. In case the ambulance is needed, he informs the operations shift foreman.
 - Thereafter, if necessary depending on the condition of the IP, the Safety dept. calls the

Hospital and the company doctor and gives information, in order the IP to have a better treatment.

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| During Office non-working hours: | <ul style="list-style-type: none"> - The operations shift foreman following first aid treatment decides how the IP will be transported to the Hospital. - Then, if necessary depending on the condition of the IP, he calls the Hospital and gives information, in order the IP to have a better treatment. - He asks from the Guard House to call the Emergency Response Team and the company doctor. |
| Construction sites: | <ul style="list-style-type: none"> - The Supervisor of the injured person assures that the injured person (IP) receives first aid treatment and informs the Project Manager, the Plant Manager and the HSE Manager. - The Supervisor / Project Engineer evaluates the condition of the IP and how he will be transported to the Hospital. In case an ambulance is needed, he informs the plant Guard House / Plant Switchboard. - Thereafter, if necessary depending on the condition of the IP, the Safety dept. calls the Hospital and the company doctor and gives information, in order the IP to have a better treatment. |

4.2. Offshore Facilities

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| During Office working hours: | <ul style="list-style-type: none"> - The Supervisor of the IP assures that he receives first aid treatment and informs the department's superintendent, the Plant Manager and the Safety Department. - Then, he calls the Guard House and gives information, which could help, provide better handling of the incident. - He asks the Guard House to send a boat to transport the IP and an ambulance to the Kavala port to receive the IP. |
| During Office non-working hours: | <ul style="list-style-type: none"> - The shift Supervisor assures that first aid treatment is given to the IP and calls the Guard House giving information which could help provide better handling of the incident. - He asks the Guard House to send a boat to transport the IP and an ambulance to the Kavala port to receive the IP. - He informs the Guard House and asks the guards to call Emergency Response Team and the company doctor. |
| Construction sites: | <ul style="list-style-type: none"> - The Supervisor of the IP assures that he receives first aid treatment and informs the Project Manager, the Plant Manager and the HSE Manager. - He asks the Guard House to send a boat to transport the IP and an ambulance to the Kavala port to receive the IP. - He informs the Guard House and asks the guards to call Emergency Response Team and the company doctor. |

4.3. Helicopter Evacuation

This method is considerably more hazardous in bad weather (high winds, poor visibility etc.), considering landing on such a small area. Night landings greatly increase the risk factor.

If a helicopter rescue is considered as a possibility, vital information (wind velocity and gusting, direction, visibility, rain etc.) must be provided to Administration Services Manager who will immediately follow the procedure set out below:

- He contacts the Hospital and asks for a helicopter medivac. According to the authorities only a public-service doctor (hospital etc.) may authorize a state helicopter or an ambulance use.
- The doctor communicates with the Emergency Center at 166 and asks for medivac assistance.
- In cases of an extreme emergency the Prefect or the Police or Military Authorities can request the use of a helicopter.

- If a helicopter is utilized, the helicopter-landing pad must be checked to be sure no obstacles are present which would prevent a safe approach, landing, and take-off by the helicopter.

5. Loss of Personnel Overboard from a Platform or vessel

All personnel working over the sea are required to wear life jackets and safety harness and have a rope minder at the nearest deck. In case a person is lost overboard the following action will be taken:

Any person noticing the incident will raise alarm and offer any possible assistance (throw life ring etc).

The platform Supervisor or Boat Captain will call via radio all other vessels in the vicinity to look for the lost person(s). If a rescue boat is available it will be manned and sent to assist in the rescue.

Boats in the vicinity when instructed will prepare scrambling nets, ropes and life rings.

If the incident has not been noticed or the person has not been located immediately, the Offshore Superintendent or his alternate or boat Captain, when notified, will initiate a search of the area and call the Guard House to ask for outsourcing assistance.

The Guard House when alerted will dispatch any additional boat, which may be available and inform the Marine Coordinator who will notify the Coastguard and Port Authorities and request assistance.

When the lost person is recovered he will be transported to Kavala Hospital for examination and possible treatment.

6. Diving accident

Diving accident is defined as every accident that can happen during works under the sea level.

The symptoms of a diving accident can be drowning, breathing problems, arthritis problems, headache, dizziness, nitrogen drunk, hypothermia, spasms, fatigue and apathy.

The best confrontation of a diving accident is the transportation of the injured man to Kavala Hospital and after that the transportation as soon as possible to a hospital which has special unit for diving accidents.

The closest to Kavala Hospital, which has such unit, is the Agios Pavlos Hospital in Ethnikis Antistasis 163, area of Finika in Thessaloniki.

When a diving accident is reported, the plant's guards call the National Centre of Immediate Assistance (E.K.A.B) to transport the injured man to Kavala Hospital. If no ambulance is available by E.K.A.B then the facility's ambulance is used.

The guards of the plant are calling without any delays the:

- The person in charge of the Diving Company
- The Managing Director
- The Plant Manager
- The HSE Manager
- The Financial & Administrative Services Manager
- The Technical Services Superintended
- The Marine and Transportation Coordinator
- The Company Doctor

The coordination of all the actions is handled by the HSE Manager in cooperation with Company's doctor and one member of all the divers' team.

The Agios Pavlos Hospital is kept informed so as to proceed as necessary to handle the incident. Information are given for the sea depth at the point of accident, the kind of the job, the symptoms and a phone number that the hospital can use for requesting more information about the accident.

During the transportation of the injured man by the E.K.A.B ambulance to Thessaloniki, a diver of the team accompanies him.

The diver in charge may decide the transportation of the injured man to be done with the decompression chamber that divers have under their premises. In this case the HSE Manager and Company doctor are informed.

The diver in charge is preparing and sends as soon as possible to the Management of Company an accident report.

The above described procedure doesn't replace the accident handling procedure. It was issued to cover the specific handling of a diving accident.

7. Fatal Accidents

In all cases of serious injury it must never be assumed that the victim is dead until all possible methods of resuscitation have been tried and the victim reaches the hospital. Once a licensed medical doctor has determined death, the following will apply:

Administration and Finance Services Manager informs the relevant authorities and the next of kin of the victim – Where possible a friend or relative of the victim's family should also be informed in order able to provide assistance. He also informs the Managing Director.

The Area Superintendent / Project Engineer informs the Area Manager / Project Manager and the HSE Manager and they will all proceed to the scene of the accident to commence investigation. Any safety equipment, personal H₂S monitors, breathing apparatus in possession of the victim at the time of the accident will be placed in a sealed container pending possible examination. Any other machinery or equipment involved as a cause or effect of the accident will remain shut down until a competent person has examined it.

The Area Superintendent / Project Engineer shall receive regular reports and will decide on what additional assistance is required and on what level of emergency mobilization is necessary. If other factors are involved (pollution, damage, etc.) major incident organization will apply until the situation is restored to normal.

8. General Remarks

In the event of an H₂S poisoning the supervisor of the injured person must call the company doctor directly or through the Guard House. Under no circumstances, an employee who had inhaled even a small quantity of H₂S which may cause ailment (e.g. dizziness, weakness, etc.), is allowed to continue his work during the same day of the incident.

For any injury, regardless of the severity, the Superintendent of the relevant department must be called immediately.

For any accident or a near miss accident the supervisor of the injured person must fill in an INCIDENT REPORT form and forward it to the involved people as mentioned on the form (within the same day in case of accidents or the next day in case of near misses).

For any serious accident and transport of the injured person to the Hospital by ambulance or other vehicle, the Supervisor will indicate someone to accompany the injured person, who will remain at the Hospital until the company doctor arrives.

The Lab. analyst or the shift instrument technician, or the guard in this order whoever is available, will be the driver of the company ambulance.

Mobilization of the company ambulance should be reported to the onshore shift supervisor.

For any serious accident and transport of the injured person to the Hospital the supervisor or shift supervisor should immediately ask the Guard House to call the following people or in case of their absence, their alternates:

- Department Superintendent
- Plant Manager
- HSE Manager
- Administration and Finance Services Manager
- Technical Services Superintendent
- Safety Supervisor

- Staff Supervisor
- Company doctor

The Administration and Finance Services Manager co-ordinates the response.

For all serious injuries the Administration and Finance Services Manager notifies the family of the injured person.

SECTION E FACILITY DAMAGES

1. Onshore Emergency Procedure, Plant – Construction Sites

1.1. Plan Activation

The following procedures are to be followed in the event of fire, explosion, serious escape of gas or liquid and multiple injuries.

The person noticing such an event should call the Control Room

extension telephone number 200

identify himself and give a clear and short definition of the event and the place where it took place.

The Shift Supervisor will sound the Emergency Alarm in case of emergency in the plant.

Alarm: Three (3) blasts of ten (10) seconds each, with three (3) seconds pause in between (Start).
 Continuous blast of twenty (20) seconds (End).

In case of emergency in the construction site the person noticing the event shall call the Guard House and ask for activation of the current Contingency Plan. The guards shall immediately contact the Emergency Response Team who will take over management of the situation by contacting the Project Engineer.

1.2. Safety equipment

Sigma Site is protected by visual and audible detection system for hydrogen sulphide, combustible gas and smoke detection throughout critical plant areas, consisting of:

- Automatic H₂S detectors, which activate an alarm in the control room.
- Manual H₂S alarm stations, which activate an alarm in the control room.
- Combustible gas detectors and alarms, which activate an alarm in the control room.
- Manual fire alarm stations, which activate a local horn and strobe light and alarm in the control room.
- Ionization smoke detectors, which activate a local horn and strobe light and an alarm in the control room.

Control room, substation building, safety buildings, laboratory, office building and PPC building are pressurized for possible sour gas intake. Combustible gas sensors detect the air intake at the air-conditioning system and sound alarm in the control room and shutdown the air intake.

In case of pressure loss in the building a differential pressure switch will be activated and alarm will sound in control room.

If the control room is contaminated with H₂S, a cascade system in conjunction with 5 minute Scott Breathing Apparatus is available to be used to carry out a safe emergency shutdown (E.S.D.).

Since no toxic gases hazards exist in the construction sites no H₂S detection equipment are necessary. Procedures regarding combustible gas detection for hot work and confined spaces entry will be regularly implemented. A general alarm horn will be activated in case of emergency for informing all employees working in the site.

2. Onshore Fire fighting

2.1. Response Procedure

The person noticing such an event should call the Control Room

extension telephone number 200

identify himself and give a clear and short definition of the event and the place where it took place.

The Shift Supervisor will sound the Emergency Alarm.

Alarm: Three (3) blasts of ten (10) seconds each, with three (3) seconds pause in between (Start).
Continuous blast of twenty (20) seconds (End).

Personnel who does not have immediate responsibilities in fire fighting and whose work is not in the immediate area must gather in the safe briefing areas as per emergency procedures.

Persons working near the fire area must first take care of their personal safety as well as the safety of their work and then help in fire fighting, if needed.

Any maintenance work-taking place in the fire area must be interrupted and the various equipment should be turned off or removed from the dangerous area (e.g. oxygen - acetylene cylinders).

All phone calls must be interrupted immediately after the fire alarm so that the telephone lines remain free for emergency calls. Only the Plant Manager and the section supervisors are allowed to call to the fire area for information. The outgoing telephone lines of the switchboard will be used only for emergencies.

In case of fire in a construction site the Project Engineer calls the plant Guard House and initiates the implementation of the current Contingency Plan. The construction site firefighting team immediately starts fighting the fire while all personnel with no firefighting responsibilities remain at the availability of the Project Engineer in an adjacent place outside the site.

2.2. Use of Fire Trucks

Water – Foam Fire Truck: One operator from units 200 – 300 – 400 – 500 operates the truck monitor and the second operator together with the Offsite operator put in service the nearest plant fixed fire monitors fireman and connect the fire truck to the fixed fire hydrants with hoses for refilling. Thereafter and depending on the needs they connect and use the fire hoses, portable foam systems and rubber fire water hoses.

Dry Powder Truck: The dry powder fire truck does not move at first. It moves to the fire site only if it is judged necessary. The truck will be driven to the fire site if necessary, by the driver of the water/foam fire truck with the fire chief instructions.

2.3. Fire Category “ONE”

It is a fire, which can be extinguished successfully by the firefighting team.

The person who first notices the fire will notify the Control Room (Plant) / Project Engineer (Construction site) either verbally, or by telephone (200, for the plant), or by radio (walkie-talkie) or through local fire alarm station.

He will report his name and give information on the location and the size of the fire.

In any case, depending on the size and the type of the fire, he will do everything he can to put out the fire with the local available fire fighting equipment or he will rush and inform the plant Control Room / construction site Project Engineer.

The Control Room operator / Project Engineer who received the message will repeat it to ensure he received it correctly. Then he will activate the plant / construction site alarm horn and he will inform the fire chief who becomes the Co-ordinator of all firefighting actions.

The water/foam fire truck proceeds immediately to the control room to receive the fire fighting team members unless it was ordered by the fire chief to proceed directly to the site of fire.

In case the construction site lies close to the plan it will be assessed it's availability for participating in the firefighting base on the plant needs.

The Fire Chief indicates the steps of actions to be taken and the use of the available firefighting equipment. Depending on the progress of the operation he may alter the actions and the equipment. In case he judges that the fire turns to category “two” he instructs the guard house to call the Fire Brigade and the Onshore Emergency Response Team if the fire is during office non-working hours.

The remaining people on the shift who are not involved in the fire fighting team remain at their positions under the commands of the fire chief.

The standby plant operators (if present) go to the control room and remain under the commands of the fire chief.

2.4. Fire Category “TWO”

It is a major fire which moreover the firefighting team requires:

- The emergency response team is alerted.
- The Kavala Fire Department is alerted.
- The nearby fertilizers industry is asked for assistance, in case the terms of the respective agreed emergency procedure apply.

In case of a fire and when the guardhouse is instructed by the fire chief to call the emergency response team, the guard calls by phone the persons included in the relevant form and gives the message

“Sigma Site fire emergency” or “Construction site “A” fire emergency”

The people being called must co-operate and should try to keep the conversation short.

All the above persons must rush to the plant as soon as possible. Before they depart for the plant they must inform their staff who can help directly or indirectly in the firefighting.

After the arrival of the Fire Department the fire chief cooperates with the Fire Department Officer in charge and informs him on the situation, the specific conditions and the potential dangers.

When the Fire Chief is convinced that the Officer in charge has fully understood the situation they together decide and continue directing the actions for extinguishing the fire.

2.5. Fire at the Xylene Storage Tanks (Parking Area)

The guards, who will most likely notice the fire first inform the control room and immediately open the manual fire water valve located by the sea water pumps to activate the tanks’ fire water deluge system.

The firefighting team proceeds to the site of the fire with the water/foam fire truck and from a safe distance attempts to put out the fire and simultaneously discharge large quantities of water on the tanks to prevent temperature rise.

2.6. Fire on a vessel at Sigma Dock

The main firefighting team proceeds to the dock area with the water/foam fire truck. There the fire chief in cooperation with the vessel captain decides how to act and use the available equipment.

2.7. Fire Outside Sigma Plant Boundaries

In no case the fire trucks move out of the plant boundaries (e.g. farm fires, neighbouring plants, communities) without the permission of the plant manager or his relief.

Exceptions can be made only in case of fire at the old abandoned rubbish area lying in a close distance of the plant, where:

- During office non-working hours and if the fire can be fought successfully by the fire truck the fire chief sends the water/foam fire truck to the fire site with at least one operator equipped with a walkie-talkie.
- During office working hours the safety supervisor takes action after he informs the operations shift supervisor.

2.8. Fire at a construction site

In case of fire in a construction site the Project Engineer calls the plant Guard House and initiates the implementation of the current Contingency Plan. The construction site firefighting team immediately starts fighting the fire while all personnel with no firefighting responsibilities remain at the availability of the Project Engineer in an adjacent place outside the site.

In case the construction site lies close to the plan it will be assessed it's availability for participating in the firefighting base on the plant needs. In case fire turns to category "two" he instructs the guard house to call the Fire Brigade and the Onshore Emergency Response Team.

3. Offshore Emergency situation

An emergency situation could include hydrogen sulfide leakage, explosion, fire, multiple injuries and personnel loss overboard. In such cases personnel assemble to the main or alternative safe briefing area and wait for instructions regarding abandonment.

The shift supervisor will sound the emergency situation alarm.

Alarm: Repeated pulse sounds through the public address system (P.A) or Three (3) blasts of ten (10) seconds each, with three (3) seconds pause in between (Start). Continuous blast of twenty (20) seconds (Start).

Announcement through the P.A system (End).

4. Fire fighting on a platform

4.1 Plan Activation

The shift supervisor will sound the emergency situation alarm.

Alarm: Repeated pulse sound through the public address system (P.A) or Three (3) blasts of ten (10) seconds each, with three (3) seconds pause in between (Start). Continuous blast of twenty (20) seconds (Start).

Announcement through the P.A system (End).

Persons who do not have immediate responsibilities in firefighting and whose work is not in the immediate area must gather immediately at the helideck's safe briefing area. Persons working near the fire area must first take care of their personal safety as well as the safety of their work and then help in fire fighting, if needed.

Any maintenance work taking place in the fire area must STOP and all equipment and machinery should be turned off or removed from the dangerous area (e.g. oxygen-acetylene cylinders).

All radio calls (VHF) must be interrupted immediately after the fire alarm so that the radio channels remain free for emergency calls.

When the fire is on Delta platform the barge "LIMIN PRINOS" (which connects at Delta boat landing) crew stays on the barge, starts the barge fire water pump and fight the fire with the Delta platform personnel.

During the gathering of the standby fire-fighting team the safety supervisor or his replacement sees that the book with the names of the people is brought to the helideck.

In case of absence of the safety supervisor his replacement is the Mechanical Maintenance Department Foreman.

4.2 Safety equipment

Because of low manpower availability in case of an Offshore fire, priority action is given to ensure the safety of personnel, isolate the source of the fire and energize of the automatic fire fighting systems.

All platforms are protected by an automatic water / foam deluge system. The electrical substation and control room are equipped with a fixed fire extinguishing system.

The platforms' firefighting system is subdivided into 10 zones each covering critical sections of the wellhead and process equipment. Zones 5-6-7 are a combination seawater/ foam units. In addition the upper deck of Delta platform and all boat landing areas are protected by oscillating firewater monitors. The water deluge system is also activated by the UV sensors.

A fixed system protects the control room and switchgear room. When the system is activated there is a 15 second delay between the alarm sounding and the dumping of firefighting agent in internal areas.

When the alarm sounds, all persons in the area must put on their breathing apparatus and evacuate the enclosed areas immediately.

4.3 Fire Category “ONE”

It is a fire, which can be extinguished successfully by the fire-fighting group.

The person who first notices the fire informs the control room either verbally, or by P. A. (loudspeakers) or radio (walkie-talkie) and gives information on the location and the size of the fire. In any case, depending on the size and the nature of the fire, he does everything he can to put out the fire with the local available fire fighting equipment or he rushes and informs the control room.

The control room operator repeats the message to ensure that is right. Then he activates the air horn and he informs the fire chief who becomes the co-ordinator of all fire fighting actions.

The control room operator announces the incident on the P. A. (loudspeakers) so that all people on board hear about it and provides information on the wind direction and speed, the stairways that should be used in connection with the direction of the blowing wind and advises all the day-people to use their personal equipment and assemble on the helideck safe briefing area. The announcements by P. A. (loudspeakers) must be repeated twice and be slow, loud and clear.

Also the control room operator informs the Sigma Site control operator, the Sigma Site Guard House, Alpha and Beta Platform and the standby vessel.

The Fire Chief indicates the steps of action to be taken and the use of the available fire fighting equipment. Depending upon the progress of the operation he may change the actions and the equipment. If he judges that the fire turns to category “two” fire he instructs the control room operator to call the standby vessel and through the Sigma Site Guard House to call the port fire patrol boat and the emergency personnel group if the fire is during office non working hours.

The remaining people on shift and the standby operator (if present) assemble in the control room and remain under the command of the fire chief.

4.4 Fire Category “TWO”

It is a major fire, which besides the fire-fighting group requires:

- Calling the onshore emergency response team
- Calling the standby vessel
- Calling the port fire patrol

When the guard at Sigma is instructed by the Delta control room operator to call the onshore emergency response team, he calls all persons mentioned in the relevant form and gives the message

“Delta fire emergency”.

The people being called must co-operate and should try to keep the conversation short.

All persons being called must rush to the port or to the Sigma plant and before they depart they must inform their staff people who can help directly or indirectly in the fire fighting.

After the arrival of the support vessels the fire chief informs their captains either one by one or all at the same time depending on the time of arrival of each boat in the area. The fire chief informs them on the whole situation, the specific conditions and the potential hazards taking into consideration the direction and the speed of the blowing wind.

When the fire chief is convinced that the boat captains have fully understood the situation asks them to perform certain duties for the extinguishing of the fire.

4.5 Fire on Upper Deck

When the fire is on the upper deck or higher the whole fire fighting team is involved except the Lower Deck operator who starts the diesel fire water pump in case it does not start automatically and checks the process equipment (vessels depressurisation, check that all wells closed, isolation of lines, e.t.c.).

4.6 Fire on Lower – Mezzanine deck, “Alfa” and “Beta” platforms

The whole fire fighting group is involved except the UPPER DECK operator who starts the diesel fire water pump in case it does not start automatically and checks the process equipment (vessels depressurisation, check that all wells closed, isolation of lines, e.t.c.).

4.7 Fire on barge "Limin Prinos"

The firefighting group in co-operation with barge crew try to put out the fire.

If the fire chief sees that the fire is extended he calls the standby boat to tow the barge away from the facilities.

5. Emergency on Work Over Rig and Service Rig - Blow-out procedures

5.1. Response Procedure

The Drilling / Workover Foreman will:

- Evaluate situation and if determined as major incident, declare a major incident and immediately implement the Contingency Plan.
- Immediately advise the General Drilling / Workover Foreman.
- Proceed immediately to the incident site and assume Site Director responsibilities.

The Drilling / Workover Foreman in co-operation with the shift Supervisor will:

- Give all possible assistance to victims.
- Attempt to minimize further consequential damage by requesting Delta to ESD the platform.
- Initiate remote kill operations.
- Raise the "abandon" signal if required.
- Instruct personnel of the preferred way to abandon platform.
- Ensure abandonment takes place in a calm and orderly manner.

Following the successful abandonment, the Drilling / Workover Foreman shall:

- Consult with the General Drilling / Workover Foreman to explore ways of minimizing further injury and damages.
- Form a boarding team and standby on the boat at a safe distance from the installation and wait for instructions.

The Drilling / Workover Foreman reports as follows:

- To Delta control to activate emergency procedures for platform safety, e.g., emergency shutdown, fire water system, etc.
- To Guard House to mobilize boats for search and rescue operations first and clean-up operations later.
- Submit a written report to the General Drilling / Workover Foreman within 24 hours from the time the emergency became an uncontrollable event, or from the time the platform was abandoned.

The General Drilling / Workover Foreman requests Coordination Director to advise:

- The Administration and Finance Services Manager to:
 - o Coordinate boat movements for search and rescue operations, pollution clean-up and fire fighting operations, medical assistance and other requirements.
 - o Request assistance from other boats, or aircraft.
 - o Notify local authorities and union personnel.
 - o Notify next of kin in case of death or injury.
- The Managing Director to notify Ministry of Development, legal advisors and Partners.

- The Offshore and Onshore Operations Superintendent and his on site designate, if between 4 P.M. and 8 A.M.
- The Drilling & Production Manager, the Plant Manager and the HSE Manager.

The Drilling / Workover Superintendent should submit a written report to the Drilling & Production Manager within the next 3 days from the time the incident occurred, fully explaining why incident occurred, measures taken, listing names of injured, missing, dead, etc.

5.2. Firing of the well(s)

Depending on the situation, an early consultation and decision will be made between the Site Director, Coordinator Director and the Managing Director whether to set a hydrocarbon blow-out well or a major uncontrollable hydrocarbon leak on fire.

The decision will be based on the effects the blow-out and the resulting oil pollution and H₂S contamination have on the:

- Surrounding population
- Natural environment
- Sea and air transport
- Well control operations
- Installation

5.3. Remote kill operation

The procedure includes using reserve mud and/ or seawater from an unaffected well platform and directing these fluids via existing high pressure pumps and kill manifold to the problem well. Alternatively, a workboat may be used for the location of high pressure pump and mud tanks, and hooked to the remote kill system at a suitable location using flexible piping / hoses.

5.4. Well Capping

This is economically the most attractive way of well control provided the blow-out is through the casing which is not damaged below a practically accessible level.

The procedure involves the installation of a special wellhead with the aim of pumping control fluid into the blow-out well for which a re-entry may be necessary.

This operation is carried out by a contractor specialized in blow-out control work (e.g. Boots and Coots). The application of this kill technique could be difficult because of the presence of H₂S.

5.5. "Direct Killing"

To control a blow-out by this method a relief well has to be drilled in such a way that direct communication between the relief well and the blow-out well be established at, or very near to, the blow-out horizon.

5.6. Standard Procedures and Equipment

The work over rig is equipped with a double and a single gate NL Shaffer BOP's, (i. e. two sets of pipe rams which can be dressed 3-1/2" or 2-7/8" and a set of blind rams) an annular BOP (Hydril), a "McEvoy" choke manifold and a "Willis" manual choke.

All this equipment is rated at 5000 psi working pressure.

The W.O. Supervisor should ensure that all BOP components are in good condition and are fully functioning at all times. While the rig is in operation, the BOP stack should be pressure tested once a week according to Energean's specifications and it should be function tested once a day.

It is standard practice that once a well is killed prior to any servicing operations, the well will always contain sufficient mud of the correct density to contain formation pressure as per the appropriate program. In addition, mud reserves will be maintained as shown below.

Whenever possible, the Workover of Service Rig should keep 200 bbls of 1.8 S.G. mud in reserve to enable killing of tubing strings. In the absence of mud, the alternative is to use seawater derived either from Delta's fire system or pumped by workboats. Additional high pressure pumping equipment is available in Kavala and may be installed and used on a boat deck.

6. Fire Fighting and Emergency Procedure for “Lamda” and “Omicron” Platform

6.1. Safety equipment

A full array of fire, hydrocarbon gas and H₂S detectors will be installed together with ESD pushbuttons strategically located. Topsides F&G detection will automatically shut wellhead valves and gas lift and production riser topsides Emergency Shut-Down Valves (ESDVs).

The emergency alarm shall be audible in all areas of the Platform and shall have a sound level 5 dBA above ambient noise level. It shall be provided with an uninterruptible power supply for a minimum of 1 hour following loss of main power. The Emergency Alarm system shall be provided as a permanent installation, capable of enunciating alarm signals so that they can be heard throughout the Platform. Public Address facilities shall not be provided, so that the General Alarm system can be kept as simple as possible. Alarms shall be broadcast by use of klaxons or tone sounders. In high noise areas, visual alarms (flashing beacons) shall be used to supplement the audible system. Alarm shall be initiated automatically on confirmed detection of fire or gas.

Manual Alarm Callpoints (MAC) shall be installed at strategic locations around the Platform so that no person will be more than 15 metres from any one call point and according to the following principles:

- In the Temporary Shelter/ LIR
- Along main escape routes
- At the mustering point

The MACs shall be protected from unintentional use and shall be clearly marked with their function.

6.2. Firefighting & Emergencies

Basic starting points with respect to Fire and Explosion Protection for the Facilities Design are:

- SIPs are Normally Unmanned Installations (NUI)
- Fire / Explosion prevention shall be provided by
 - o Minimization of leaks through inherent safety design practices (e.g. Minimize total inventory, minimise potential leak paths by using small bore pipework, opting for butt-welded rather than flanged connection, Maximise use of non-intrusive instruments, etc..)
 - o Exercising safe working practices when platform is manned (e.g. start-up, maintenance, well intervention, etc); these activities are taken into consideration during the design phase (e.g. by providing utilities like maintenance flare)
- Fire/Explosion protection shall be provided by
 - o Timely detection of leaks (by use of a fire/flammable gas/H₂S detectors system) and shutting down of SIFT (Total Platform ESD)
 - o Open module platform type to provide ventilation
- Fire/Explosion consequences mitigation shall be provided by:
 - o Active Fire Protection for systems and for protection of personnel: firewater deluge in wellhead area and muster station
 - o Passive Fire Protection systems (e.g. requirements for structural integrity or fire resistant walls)

The design of the fire and explosion protection concept is such that escalation of an initiating event into an event that could threaten escape, the integrity of the Temporary Refuge and the evacuation system within the required time scale is ALARP.

- Access to the platform is possible by marine intervention or rig intervention. For marine intervention an adverse weather policy applies. During marine intervention a workboat is always stand-by to enable evacuation from the platform.

- During simops (only) the wellhead area and flowlines have fire protection. The rig will have its own self-contained active fire protection systems which can be used to supplement the platform system.
- Portable manual firefighting equipment will be permanently installed and additional equipment will be brought on board by maintenance crew as required by permit-to-work.
- In the event of a hazardous situation, POB are expected to muster in the designated muster area, monitor the situation, raise alarm and if necessary, abandon platform immediately.
- Accessible and diverse escape routes are provided. Automated ESD valves and Wellhead isolations valves operable by both remote and local pushbuttons –buttons installed at each escape route.

Other key safety design requirements:

- All topside areas shall be designed as naturally ventilated. As the installation is not normally manned, wind walling/ louvre will not be required.
- Electrical equipment and Instrumentation provided in air conditioned containers suitable for the appropriate hazardous area classification zone and pressurized to prevent flammable vapor ingress.
- If the modules cannot be located in a safe area then the ventilation inlet air shall be drawn from a safe location and the modules shall be provided with an air lock plus two means of escape.
- The ventilation inlet system shall be installed with fire dampers, which shall be activated by the Platform F&G system, which shall include initiation on H2S detection.
- Leak/Fire/explosion prevention, mitigation and protection measures shall, as much as possible, be identical to current measures used at Prinos complex.

The advantages (as well as legal requirements) of an active fire-fighting system in the wellhead area (cellar deck) and Temporary Refuge (TR) should be considered when platform is manned (e.g. during SIMOPS, start-up or maintenance).

This means that as a minimum, a dry deluge and ring main shall be provided for these areas. Feeding the system with firewater will be done in several ways:

- By connecting to the supply vessel's or barge's firewater system
- By connecting to the rig's firewater system

Hard piped connection points to the platform fire water ring system will be provided at the boat landing stations and at the drilling rig gangway location. The firewater systems of supply vessel, barge and rigs will be assessed and upgraded as required to meet the requirement to be used as SIP firewater sources.

The drilling barge and/or supply boat will supply the air by connecting with flexible hoses and quick release system in case the supply boats needs to abandon it's boat landing station.

Possibility to use the injection water system should be investigated during detailed design. This is possible provided the Water injection system ESDV can be kept open in a fire scenario.

A small foam tank will allow foam to be used on oil fires. A line from the system will be run down to the boat landing area to allow connection to the supply boat.

Fire prevention and protection is the subject of a dedicated study required as part of the permitting process and its recommendations will be incorporated in the detailed design of the SIPs.

7. Fire Fighting and Emergency Procedure for “Kappa” Platform

7.1. Safety equipment

This platform is designed to operate unmanned. Scheduled visits are performed every Thursday and extra ones in case of restoration or maintenance of the equipment.

The alarm system includes:

- Two non-explosive electrical alarms with moderated sound. One is placed on the upper deck and the other on the well deck.
- Three alarm manual stations. One is placed on the upper deck close to north staircase, the other on the well deck close to north staircase and the last one on the lower deck in front of the entrance door.

- One strobe light that is placed on the lower deck next to alarm manual station and the ESD switch.

The alarms and the strobe light are activated as follows:

- Activation of the gas detectors (2 out of 3), which are placed on the well deck.
- Activation of the fire detectors (2 out of 4), which are placed on the well deck.
- Activation of one or more alarm manual stations.

The alarms after their activation, sound for 45 seconds and afterwards, stop to sound despite the fact that the activation conditions remain or not.

The strobe lights remain active till the time of restoration of the activation conditions.

In case of automatic activation of the alarm system (fire detectors and/or gas detectors), the KAPPA ESD system is activated automatically, which means that:

- The three safety valves (wing, master and downhole) of both wells, SK-3 and SK-4, shut off.
- The supply of electrical power to the two electrical heaters (H-171B and E-171) and to the heat tracing is stopped.
- The injection pumps of chemicals/methanol are stopped.
- The SDV-972 shut-off.

After the shut-off of the SDV-972 and the isolation of the wells, any gas leakage or fire from gas leakage will stop or extinguish respectively in a short time.

7.2. Emergency Procedure Activation and Implementation.

Kappa ESD system and the activation of UV and gas detectors become perceptible to Delta platform through SCADA. The shift supervisor gives immediately the order and a boat is directed from Delta to Kappa platform in order to control the situation, solve the problem and afterwards begin the operation of the platforms. Since everything is safe.

In case of a bigger fire, the fire-fighting team acts immediately and the Harbour Fire Patrol is informed as indicated on Fire Fighting Procedure of Delta Platform.

In the case where personnel is on the platform and an emergency occurs (fire, gas leak, explosion, man overboard etc.) the personnel which is on the platform at that time takes the following action.

The person that will perceive the event first will immediately notify the remaining people by shouting or using the alarm system if it hasn't been already activated (UV and/or gas detectors).

Person in charge of all the actions becomes the senior employee in the group (between various departments senior is considered the person from Operations). If the person in charge sees that the situation cannot be controlled, he immediately activates the Kappa ESD system, if it has not already been activated, informs Delta platform and follows the shift supervisor's instructions.

Safety briefing area, in case there is a boat tied up to the platform, is the boat landing. In case there is no boat, the people are gathered in front of the rescue boat on the upper deck.

The actions followed, in order to cope with the event depend on the extent and the severity of the event and they are always taken with the instructions of the person in charge. Depending on the situation these actions will be:

- Preparation and lowering of the rescue boat.
- Lowering of inflatable life raft.
- Lowering of rigid life raft.
- Activation of distress signals.
- Use of individual life vests by all people on board.
- Start of firewater pump.
- Use of portable fire extinguishers and fire water lines.
- Boarding on tied-up boat at the boat landing.

- Correction of the problem and restoration of platform operation.

If additional help is needed to cope with the situation or correct the problem, Delta platform is informed and they see that a team is sent to Kappa as it is mentioned above in the case where no personnel is on Kappa platform.

In case there is a man overboard and he is in danger, the first person who sees him shouts “man overboard” and activates the alarm system. Immediately a lifesaving ring with rope and light signal is thrown at the man in the water. The person in charge informs Delta platform and gives instructions to lower the rescue boat to pick the man up. If there is a boat tied to the platform it is immediately instructed to go and pick the man up.

Depending on the severity of the incident and the personnel available, the person in charge can decide the changes that can be made on the procedure or actions that can be taken for better confrontation of the situation.

In case of abandonment using escape boat, the person in charge carries with him the walkie-talkie in order to communicate with Delta platform or other boats, which are in the area.

8. Abandonment procedure

8.1. Decision making

In the unlikely event of a major accident at the offshore platforms complex such as well blow out or major plant failure, it may be necessary to abandon platform(s).

The decision to abandon and the method to be used will be made by the Site Director or his alternate.

The method used may involve the use of the survival boat, life rafts or embarkation on the standby boat from the platforms boat landings depending on the nature of the event, the prevailing circumstances and the wind direction.

8.2. Offshore Procedures

Since a decision to abandon has been taken the Site Director or his alternate shall carry out the following actions:

- Notify Sigma control room and guardhouse by the radio that abandonment of Platform is under way and method being used.
- Alert standby boat that abandonment is underway and instructs boat as to exactly what action is required of it i. e. whether or not it is required to pick up personnel at any of the boat landings.
- Check the number of personnel assembled against control room log or personnel known to have been on Platform. Ensure that missing personnel can be accounted for. Give names of all persons to be evacuated and any missing to guard house.
- Request Delta Control to ESD the platforms, “D”, “A”, “B”, “L” OR “O” and depressurise the gas pipeline to the flare, isolate and depressurise the process equipment to flare, by pushing ESD and shutdown all other running equipment with the exception of the fire water system.
- Ensure all personnel is instructed of the escape method and route to be followed, and is equipped with fully charged 5 minute Scott air-packs.

If using survival capsule, move to escape station, board the capsule, connect to the cascade system and launch.

If using standby boat, make sure it is ready at appropriate boat landing before leaving safe briefing area. Move calmly to conserve air supply.

Survival capsule boat must move away up wind from Platform area. Written report on the incident to be provided as soon as possible.

8.3. Standby boat

- Prepare to manoeuvre as requested by Site Director or his designate.
- If requested to take crew off the boat landings, sound horn when in position to pick up crew and call on radio.

- Remove crew to safe distance up wind and provide first aid as necessary.

8.4. Onshore Procedures

Sigma control room shall inform Operations Superintendents of the incident.

Guard House shall inform:

- Managing Director
- Drilling & Production Manager
- Plant Manager
- HSE Manager
- Administration and Finance Services Manager
- Technical Services Superintendent
- Marine Coordinator

The Administration and Finance Services Manager in cooperation with marine coordinator shall:

- Dispatch all additional Company's vessels at Kavala quay to location, with fire fighting and first aid equipment and medical personnel.
- Notify Kavala Harbour Master and other Authorities.
- Notify Ministry of Development.

The Managing Director, the Drilling & Production Manager, Plant Manager, HSE Manager and Technical Services Superintendent will proceed to Emergency Response Center.

9. Emergency Procedure for barge "Limin Prinós"

9.1. Offshore facilities

When the barge is berthed at "Delta" Platform:

- Informs the Delta control room (radio ch. 14).
- Puts the firefighting system in operation and uses the available fire fighting equipment if necessary.
- Takes all the required steps of action to get the barge away from platform.

In case of emergency the barge crew moves away any working crews on barge.

Depending on the emergency the barge crew uses the available breathing masks or life jackets.

9.2. When the barge is away from Kavala Oil installations or navigated

- Informs the Guard House (radio ch. 10) and asks for assistance.
- Crew embarks on barge (if the barge is tugged and the crew gets on the tug boat) puts the fire fighting system in operation and uses the available fire fighting equipment if necessary.
- Takes all necessary steps of action to bring the situation under control.
- Prepares the rescue boat in case of barge abandonment.

In case of emergency the barge crew moves away any working crews on barge.

Depending on the emergency the barge crew uses the available breathing masks or life jackets.

9.3. Sigma Site

When the barge is at Sigma-Site:

- Informs the plant control room (radio ch. 14) and asks for assistance.
- Puts the firefighting system in operation and uses the available fire fighting equipment if necessary.

- Directs and coordinates the action of the crews which arrived for assistance (plant fire fighting crew or fire department).

In case of emergency the barge crew moves away any working crews on barge.

Depending on the emergency the barge crew uses the available breathing masks or life jackets.

10. Gas releases

10.1. Flare flame out

The heights of the Onshore and Offshore flare tips have been designed to provide adequate hydrogen sulfide dispersion even in the event of a flame out or flare ignition system failure.

Upon notice that there is a flame out and after the conditions have been evaluated, the Operations Supervisor will arrange to relight the flare using the flare gun, which is available in each control room.

10.2. Substantial gas leak or line rupture

10.2.1. Onshore Facilities

The shift foreman checks the wind direction and if necessary sounds alarm in Plant and activates the Contingency Plan. He calls the Guard House and asks them to call the Emergency Response Team and to inform:

- Delta platform, Site Director and Coordination Director
- the Fertilizing Industry and all the nearby installations

The Emergency Response Team informs:

- The local authority and the local population

The shift foreman makes all efforts to depressurise the pipelines to Sigma and Delta flares. The Axelson valves may need to be opened manually to allow complete depressurization of the pipelines.

10.2.2. Offshore Facilities

The Control Room of Delta platform:

- Shuts down the gas line.
- Vents down the gas line to the flare.
- Shuts down oil and gas production on Alpha, Beta, Lamda, Omicron and also Delta platform.

The Site Director will specify specialized teams (5) as required based on the actual incident in progress.

An evaluation team will be immediately sent by the Site Director to determine the exact location and source of the leak and evaluate the advisability of igniting the escaping gas.

Considerable care is required especially if there is little or no wind and a cloud of gas has collected.

Particular notice must be taken of the position of the gas cloud relative to Sigma Site, platforms and other installations, people and vessels / vehicles.

Advises local authorities and requests their help in keeping public at a safe distance particularly on down wind side. In some circumstances it may be necessary to evacuate the area.

Advises the Coordination Director that pollution control team may be required.

Alerts the HSE Manager for medical services, ambulance etc.

11. Mutual assistance procedures with the Phosphoric Fertilizing Industry

11.1. General

A major accident is defined as a fire which can not be controlled by the personnel of the affected plant, e. g.

- a major fire at the Nitric Ammonia plant of P.F.I

- a major fire at the crude storage tanks of Kavala Oil S.A.

11.2. Major accident during office non working hours

In case a major fire occurs at the oil plant the shift supervisor calls the shift supervisor of P.F.I at the new nitric ammonia plant (317100 ext. 207). He reports the incident, describes it's extend and type and asks for assistance.

In case a major fire occurs at PFI the Fire Chief calls the shift supervisor of the oil plant (317201). He reports the incident, describes it's extend and type and asks for assistance.

The supervisor who received the call hangs up and verifies the phone call by calling back the caller.

The receiver will inform his company management and he will send a water / foam fire truck with only the driver.

When the truck arrives at the site of the incident the driver is under the supervision of the man in charge of the affected company.

The company management that received the call for assistance is in continuous contact with the management of the affected company in case of additional assistance is required in material or personnel.

11.3. Major accident during office working hours

In case a major accident occurs during office working hours the same procedure will apply with the exception that the assistance will be coordinated between the Plant Managers.

11.4. Other Specific Major Accidents

In case of any other specific major accident (during office working or non working hours) the necessity of mutual assistance will be coordinated by the two company managements.

The appropriate staff of each company will inform their personnel as to the above procedure.

The above procedure is accepted by both companies and is valid starting April, 2000.

12. Mutual assistance agreement between refineries

In the agreement are participating the following refineries.

- Hellenic Petroleum S.A (Aspropirgos Refineries)
- Hellenic Petroleum S.A (Elefsina Refineries)
- Hellenic Petroleum S.A (Thessaloniki Refineries)
- Motor Oil Hellas – Corinth Refineries
- Kavala Oil S.A. / Energean Oil & Gas

The above facilities decided to implement the following agreement for mutual assistance for the good of the public and following the guidelines of the European Directive 96/82 EU, the Common Ministerial Decision 5697/590/2000 and according the Annex T of "Xenokratis" national plan for the remediation of impacts due to major industrial accidents.

In case of a major accident within the above companies, the affected company may activate the mutual assistance agreement and call some or all of the members for assistance.

Authorized competent personnel for activating the agreement are the following:

| | Offices' hours | Non offices' hours |
|-------------------------------|--|----------------------------|
| HE.PE S.A (Aspropyrgos Ref.) | Shift Supervisor | Shift Supervisor |
| HE.PE S.A (Elefsina Ref.) | Health – Safety – Environmental – Firefighting Manager | General Supervisors |
| HE.PE S.A (Thessalonica Ref.) | Industrial Facilities Manager | Shift Foreman – Supervisor |
| MOTOR OIL (HELLAS) | General Industrial Manager | Shift Engineer |
| KAVALA OIL S.A. / ENERGEAN | Shift Foreman | Shift Foreman |

The call receivers start the preparations for sending assistance and at the same time they communicate with the affected company to confirm the call and proceed with sending assistance without further communication.

The minimum assistance each company has to provide to the affected company is eight (8) tones of fluorine – protein base foam in barrels. Especially for Kavala Oil it is five (5) tones of fluorine – protein base foam in barrels.

The assistance is sent under the responsibility of the sending company and the sender chooses the best and fastest way of transportation.

All costs for sending and for the foam base is paid by the affected company which asked the agreement activation.

The present agreement doesn't recall the bilateral agreements between refineries, but is valid in parallel.

13. Personnel training

All Energean / Kavala Oil new employees will be trained in H2S safety including breathing air apparatus, breathing air cascade systems, resuscitator, manual artificial respiration, detection devices, explosimeters, properties of hydrogen sulphide and firefighting basics. This will be carried out prior to any actual work assignments that may involve sour gas.

Follow-up training will be given to all employees annually.

The Superintendents of each department will be responsible for the training of the personnel under their supervision. They will work in cooperation with the Onshore and Offshore Safety Officers.

All Contractor employees will be given basic safety training before permitted to work in the plant facilities.

SECTION F
SEAWATER OIL SPILLS PREVENTION AND RESPONSE

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1 GENERAL INFORMATION

The present is the “Facility Contingency Plan for Oil Spill Pollution” and will be here on referred to as the Plan.

1.1 SCOPE

The main scope of the Plan is to eliminate or minimize the adverse effects of unexpected sea and coast oil pollution incidents, in order to:

- Protect the environment.
- Protect the interests of the local community.
- Enhance employees’ safety.
- Accelerate return to normal operation of the Facilities

These goals can be met by:

- Minimizing the spread of the oil spill
- Recover the oil from the sea
- Protect the important (if not all) coasts
- Decontaminate the shoreline

The operational readiness of the oil spill response mechanism is ensured by the training of personnel, the use of special equipment and the means to combat pollution and is maintained through regular exercises in readiness based on hypothetical accident scenarios.

The Plan confirms that protection of the Environment is a priority for Energean Oil & Gas.

1.2 APPLICATION

The Plan is applicable throughout the jurisdiction of the Kavala Port Authority both at sea and on the coast.

Also, the facility is properly organized to be self-contained for the most likely oil spill scenarios up to seven (7) tons of oil.

The Plan is authorized by decision of the Kavala Harbour Master and then is communicated to all recipients of the Facilities’ Contingency Plans.

Every person that receives this Plan or a section of it or has a role and / or responsibility for any material or information included in the Plan, is obligated to ensure that:

- He is aware of his duties during an emergency situation
- He knows his immediate supervisors according to the Personnel Organizational Chart
- He is familiar with the roles and responsibilities of all the other members of the Plan’s Human Resources and,
- He keeps an updated copy of the Plan in a secure and easily accessible spot.

The Plan is considered a “sensitive” document and all its content or any part of it is not allowed to be distributed to persons, companies, public or private entities that are not official recipients of the Plan.

Competent Authority is the Directory of Marine Environment Protection of the Ministry of Public Order and Citizen Protection, which is represented by the Kavala Harbour Authority. The competent Department of the Facility is the HSE department that ensures the:

- Drafting, amending, updating, and implementation of the present Plan
- Management of marine and coast pollution incidents, according to the present Plan, for cases that are attributed to the facilities operation as well as cases of ships stranding, ships collision, ships catching fire and ships sinking.
- Available personnel and equipment is at a satisfactory readiness level to combat pollution.

- Application of appropriate methods to combat pollution with the use of appropriate equipment, materials, software packages and environmental data.
- Personnel is trained and Safety Drills are performed
- Communication of the approved Plan and its amendments to all Departments of the Company that may be involved

2 HUMAN RESOURCES AND EQUIPMENT

2.1 HUMAN RESOURCES ORGANIZATION

In the event of a pollution incident the Plant Manager, the HSE Manager and the Superintendent of the Technical Services Department constitute the Coordination Center at the factory's offices at Nea Karvali. The Plant Manager is appointed Coordination Manager and in his absence the HSE Manager takes his place. As Operations Coordinator acts the Technical Services Superintendent or his substitute. The Coordination Manager shall establish:

- The Planning Team which involves:
 - The Drilling & Production Manager
 - The Onshore Operations Superintendent
 - The Offshore Operations Superintendent
 - The Mechanical Maintenance Superintendent
 - The Design Engineers
 - The Maritime Officer
 - A team from the Kavala Port authority
 - The Group Legal Advisor
 - The Media Relations Advisor

Also, the Planning Team may engage members of Public Authorities, representatives of private bodies as well as specialized scientists, whose input is deemed useful by the Coordination Manager.

- The Task Force which is led by the Operations Coordinator and consists of:
 - The Intervention Team which involves:
 - The Valiant Energy vessel with a crew of 8 (captain and 7 persons)
 - The EPSILON boat with a crew of 4 (captain and 3 persons)
 - The SKALA PRINOS boat with a crew of 3 (captain and 3 persons)
 - The Inflatable Speed-Boat with a crew of 2 (driver and diver)
 - The Diving Boat with a crew of 3 (driver and 2 divers)
 - The LIMIN PRINOS Barge with a crew of 2
 - Additional 6 people from the staff of the Marine Sector and the Storage

The group of divers consists of 4 persons that are shared to the Diving Boat and the Inflatable speed-boat.

- The Technical Support Team which involves:
 - A truck with its driver
 - A Loader vehicle with its operator
 - A Forklift with its operator
 - A Self-propelled Crane with its operator
 - Additional 3 people from the staff of the Storage
- The Administrative Support Team which is coordinated by the Administration Manager which involves:

- The Finance and Reporting Supervisor
- The Personnel Supervisor
- The Supplies Supervisor
- The Maintenance Supervisor
- The Transportation Supervisor

The Coordination Manager works together and is briefed by the following people:

- The members of the Planning Team
- The Operations Coordinator
- The Administration Support Coordinator

The Operations Manager works together and is briefed by the following people:

- The Head of Marine Operations
- The Head of Land Operations

The Head of Marine Operations works together and is briefed by the following people:

- The Supervisor of every marine task force
- The Supervisor of the Diving Operations
- The Captains / Operators of the monitoring means

The Head of Land Operations works together and is briefed by the following people:

- The Supervisor of every coast-cleaning task force
- The Supervisor of transportations
- The Captains / Operators of the monitoring means

The Administration Support Coordinator works together and is briefed by the following people:

- The Finance and Reporting Supervisor
- The Personnel Supervisor
- The Supplies Supervisor
- The Maintenance Supervisor
- The Transportation Supervisor

2.2 RESPONSIBILITIES

During an incident, the persons referred above have the following functional responsibilities:

- Coordination Manager:
 - Works together with the Kavala Harbor Master and all parties involved for the immediate and effective commitment, coordination and supervision of all activities to prevent – contain and combat the pollution
 - Assesses the situation on the basis of personnel safety, environmental protection and safety of the facility
 - Undertakes public relations and informs the representatives of the daily press and the media
- Harbor Master: in case of a severe pollution incident he is directly involved in the planning and coordination of the combat operation (he goes to the affected area)
- Planning Team is mainly involved with the following:
 - Estimates the type and volume of the oil leakage based on the leak source and duration
 - Retrieves environmental conditions forecast for the leakage area

- Assesses the status of the incident regarding potential evolution based on the boats' observations and computing models
- Ensures communication between involved parties
- Decides on the appropriate combat methods
- Decides on the best treatment or disposal methods for oil, wastes from polluted means or solid waste material collected by the cleaning crews
- Monitors scientifically the impacts from the incident
- Collaborates with other competent divisions of the local authorizes
- Records data regarding the control of the incident and any related evolutions
- Covers legal issues and prepares potential compensation claims
- Operations Coordinator:
 - Supervises the area of the incident with the available floating, terrestrial and air means
 - Heads the Task Force Team which perform the necessary treatment operations
 - Coordinates the maritime and terrestrial transportation means, in order to avoid delays or suspension of the pollution controlling work and to expedite the removal of contaminated waste through rational use of available resources
- Administration Support Coordinator:
 - Heads the Administrative Support Team
 - Is responsible for keeping logbook of the combat actions and tasks
 - Is responsible for administrative issues regarding the effective technical support of the Task Force.
 - Collaborates with individual managers of the collaborating bodies
 - Ensures the personnel's transport at sea and on land.
- Intervention Teams proceed to:
 - The containment of the leakage
 - The oil recovery
 - The use of chemical oil dispersants (after permission of Port Authority)
 - The beach cleansing
 - The temporary storage of contained oil residuals and contaminated material
 - The final disposal of residues
 - In diving operations
- Technical Support Teams provide:
 - Personal Protection Equipment
 - Transfer of oil residues
 - Transfer of chemical oil dispersants
 - Transfer of fuel
 - Transfer of equipment and consumables
 - Transportation of personnel
 - Maintenance of antipollution equipment and machinery
- Administrative Support Team provide:
 - Supply of Personal Protection Equipment and Clothing for the Task Force teams
 - Supply of chemical oil dispersants
 - Supply of fuels
 - Supply of equipment and consumables
 - Provide additional human resources

If in the Coordination Manager's opinion the staffing and the structure of the teams as described above and the division of personnel is inadequate for the specific incident, then the structure of the teams and the distribution of staff alter in accordance to his instructions, to ensure sound coordination and supervision of combat operations.

The Coordination Manager may decide to enforce certain groups by redistributing people belonging to groups that have completed their work and can be used in cleaning other beaches in the area.

2.3 EQUIPMENT ORGANIZATION

The facility's antipollution equipment is gathered and sorted so that the correct choice of material and equipment is made in short time by the right person according to the Plan.

Moreover, the material and the equipment are easy to be inspected (since they are sorted) and all equipment is in storage facilities (see figures 2.1-2.6) and thus not affected by weather conditions.

Appendix Z.8 includes a detailed description of the type and the quantities of equipment available by the Facility.

Image 2.1: *Antipollution equipment storage*



Image 2.2: *Antipollution material sorting*



Image 2.3: *Chemical Oil Dispersant storage*



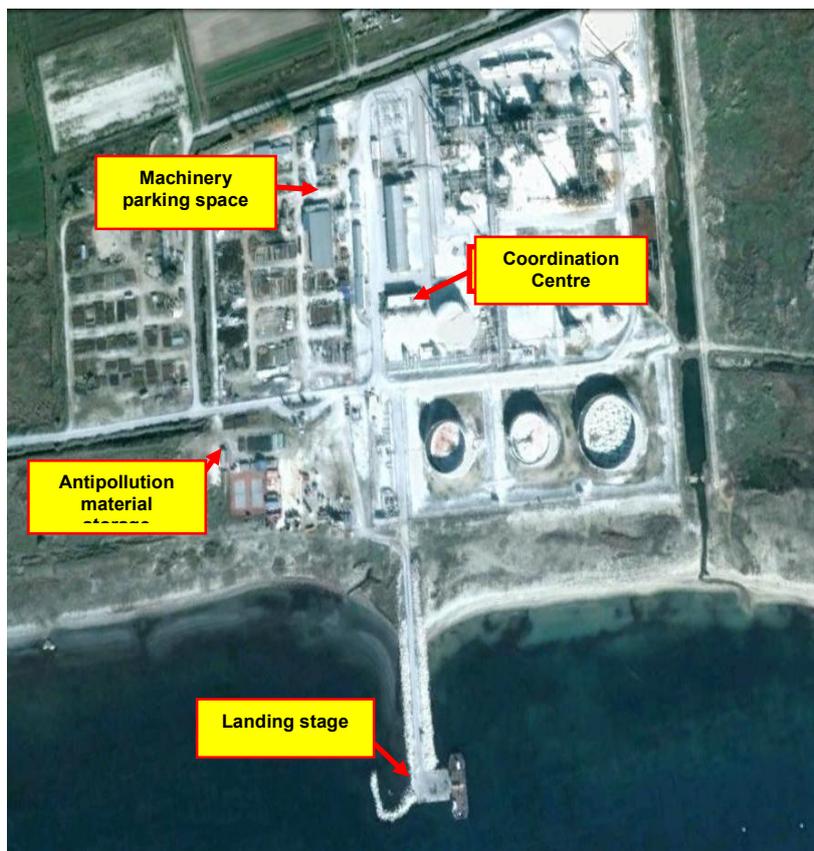
Image 2.4: *Floating barrier in reel*



Image 2.5: *Floating barriers in pallets*



Image 2.6: *Equipment storage location in the facility*



3 IMPLEMENTATION OF THE PROJECT

3.1 Activation

Any employee of the installation that notices pollution of the sea or shore with oil must inform as soon as possible the Plant's Guard House. The guards inform immediately the Control Rooms of the offshore and onshore installations, the Environmental Department of the company or the Superintendent of the Technical Services Department.

The report of the pollution incident must include the following information in the most possible certified way:

- Personal information of the observer
- Time of the incident.
- Area's data.
- Oil spill's dimensions.
- Description of oil characteristics (color, etc.).
- Information about the source of pollution (if the leak has stopped or continues).
- Weather conditions.
- Initial assessment of:
 - The safety and health of employees.
 - Plant Safety
 - The possibility of coast contamination.

The Environmental Agency must immediately notify the Coordination Manager and the Operations Coordinator.

If the Coordination Manager confirms the information, proceeds directly to the following actions:

1. Take immediate measures to stop the cause of the leak, if this can be done safely.
2. If the pollution source does not come from the installation or from activities of the company, he immediately informs the Central Harbor Master giving all the available information.
3. If the pollution source comes from the installation or activities of the company, then he starts following as soon as possible this Plan and informs the Central Harbor Master.

If the incident can be dealt with within the facilities under the current plan, no outside help is sought. Otherwise the Central Harbour Master is informed.

The Central Harbour Master considers the nature, the extent and the possible consequences of the incident and, if necessary, mobilizes the relevant authorities and bodies responsible for the timely response measures under the Local Contingency Plan - LCP.

The Coordination Manager in each case can decide the level of activation of the plan depending on the nature of the incident after the initial evaluation of existing information.

Once the decision to activate the plan is made, the following actions are taken:

1. Coordination Manager and the Planning Team members gather at the Coordination Center ensuring continuous communication with the Central Harbour Master.
2. The members of the Task Force are called from the gate to assume their duties.
3. If the incident is rated as severe, then, in addition to the members of the Task Force the Administration Support Coordinator, under the order of the Coordination Manager calls the Task Forces of the cooperating public and private institutions to assume their duties.

The Operations Coordinator and each member of Planning Team and Task Force perform his duties in accordance to those described in this Plan and the instructions of the Coordinating Director.

Depending on the severity of the incident (size, location and weather conditions of the area), the Coordination Manager may decide in consultation with the Central Harbour Master to create an additional coordination center or to transfer it at the Kavala Central Port Authority.

3.2 Operational mobilization

After activating of the Plan the following actions are taken:

1. During office hours the Coordination Center is set up at the Facility's Meeting Room.
2. The groups involved in facing the pollution are notified and gathered.
3. The Head of the Technical Support organizes and guides:
 - The loading of the necessary equipment for maritime operations and its transfer to the pier of the Installation.
 - The loading of equipment on board EPSILON boat.

4. The Head of Marine Operations guides the vessels EPSILON, SKALA PRINOS, AKRA PRINOS and VALIANT ENERGY, the diving and the inflatable speed-boat at the area of the incident and organizes the dealing with the incident.
5. Where coastal pollution is expected, the head of the technical support team organizes and guides:
 - o The loading of the necessary equipment for ground operations.
 - o The transfer of equipment and personnel of the Coastal Clean-up Teams.
6. The Head of Land Operations guides the Coastal Clean-up Teams at the area suggested by the Coordination Centre and organizes the clean-up of the coast.

More details as well as the time required to take these actions will be reported below for each case (depending on the area of the pollution incident).

The ways to deal with cases of oil pollution and their order are listed below:

- Sea pollution - when the wind speed does not exceed 16 knots.
 1. Suspension or reduction of leakage.
 2. Removal of ignition sources.
 3. Entrapment of the pollution using floating booms.
 4. Recovery of oil using oil skimmer.
 5. Use absorbent materials (for cleaning small amounts of oil).
 6. Transport and storage of solid waste at the Facility.
 7. Transport and treatment of wastewater in the Facility.
 8. Cleaning and storage of the materials used.
- Sea pollution - when the wind speed exceeds 16 knots (the ripple causes malfunction of floating booms).
 1. Suspension or reduction of leakage.
 2. Remove ignition sources.
 3. Use of chemical dispersants (with permission of the Central Harbor Master).
 4. Mechanical dispersion (several passes with all ships/vessels) of the pollution.
- Coastal Pollution
 1. Suspension or reduction of leakage.
 2. Remove sources of ignition.
 3. Use of absorbents and adsorbents.
 4. Recovery of oil with vacuum systems.
 5. Mechanical, manual coast cleaning.
 6. Transport and storage of solid waste at the installation
 7. Transport and treatment of wastewater in the Installation.
 8. Cleaning and storage of the materials used.

3.2.1 FACING SEA POLLUTION WITH WIND SPEED LESS THAN 16 KNOTS

Below listed are details of the means, equipment and techniques used in the possible pollution at the broadest sea area (platform cluster, pipeline region, anchorage).

Table 3.1: Resources needed to face sea pollution

| Required means | Executed task | Required staff for the means |
|--------------------------|---|--|
| Semitrailer Vehicle | <ol style="list-style-type: none"> 1. Transports materials from the warehouses to the dock. 2. Is ready to transfer additional materials during work. 3. Transports used materials from the pier to the cache. | 1 driver + 1 assistant |
| Forklift truck | <ol style="list-style-type: none"> 1. Loads and unloads material and equipment to / from the Semitrailer Vehicle. 2. To save time it can carry certain materials from the warehouse to the pier. | 1 operator |
| Stationary Crane SEATRAX | <ol style="list-style-type: none"> 1. Loads and unloads materials and equipment from / to vessels EPSILON and SKALA PRINOS. | 1 operator (the same as the forklift) + 1 assistant (he is from the Semitrailer Vehicle) |
| VALIANT ENERGY Vessel | <ol style="list-style-type: none"> 1. Moves to the location of the oil spill and applies the floating boom continuously transferred on it. 1. In case of chemical dispersants use, spray arms are used for this purpose. 2. An Oil Skimmer can be used in conjunction with vessel's storage tank. 2. Used for monitoring the status of dumped booms and the possible spread and movement of the oil spill. | Captain + 7 people |
| Vessel EPSILON | <ol style="list-style-type: none"> 3. Transports materials to face pollution from the pier to the platforms' space. 4. In case of chemical dispersants use, spray arms are placed for this purpose. 5. An Oil Skimmer can be used in conjunction with a portable storage tank. 6. Used for monitoring the status of dumped booms and the possible spread and movement of the oil spill. | Captain + 3 people |
| Vessel SKALA PRINOS | <ol style="list-style-type: none"> 1. Tows the floating barrier. 2. Carries anchors, buoys, ropes and accessories. 3. In case a chemical disperser is used, there is a portable spray nozzle for this purpose. 4. An Oil Skimmer can be used in conjunction with a portable storage tank. 5. Used for monitoring the status of dumped booms and the possible spread and movement of the oil spill. | Captain + 2 people |

| | | |
|-----------------------|---|--------------------|
| Vessel AKRA PRINOS | <ol style="list-style-type: none"> Carries additional staff at the site of the incident. Used for monitoring the status of dumped booms and the possible spread and movement of the oil spill. | Captain + 2 people |
| Inflatable speed-boat | <ol style="list-style-type: none"> Used for anchoring and the final placement of the dam. Used for monitoring the status of dumped booms and the possible spread and movement of the oil spill. | Driver + 1 person |
| Diving boat | <ol style="list-style-type: none"> Tows the floating barrier. Used for anchoring and the final placement of the dam. Used for monitoring the status of dumped booms and the possible spread and movement of the oil spill. | Driver + 1 person |
| Barge LIMIN PRINOS | <ol style="list-style-type: none"> The Oil Skimmer is placed on the deck and used. Used for temporary storage of recovered oil. | 2 people |

Table 3.2: Materials needed for facing marine pollution

| Anti-pollution equipment | Executed task | Required staff for the task |
|---|--|---|
| <ul style="list-style-type: none"> Two reels (500m floating barrier) Three reels (750m floating barrier) if the leak is from tanker If for some reason pallets (5x100 m) are used then additional staff is required. | Loaded on board EPSILON and towed by boat SKALA PRINOS and the diving boat. | EPSILON: 3 people SKALA PRINOS: 2 people Diving boat: 2 people Additional staff: 4 people in EPSILON |
| 10 Danforth type anchors (1 anchor per 50 m dam) | Loaded on board EPSILON and then distributed to the diving boat and the inflatable so as to be used directly at the incident area. | SKALA PRINOS: 2 people |
| 20 buoys with ropes and the necessary accessories (2 buoys per anchor) | Loaded on board EPSILON and then distributed to the diving boat and the inflatable so as to be used directly at the incident area. | Inflatable boat: 1 person Diving boat: 2 people |
| Oil Skimmer | Loaded on board EPSILON and transferred to the barge which is in the area of the incident. | Barge: 2 people Inflatable boat: 1 person |

| | | |
|---|--|---|
| <ul style="list-style-type: none"> Spray arms Chemical disperser OILER – 60 | If the decision to use Chemical disperser is made, then the spray arms are placed on board EPSILON and an amount of chemicals is loaded. | EPSILON: 3 people |
| <ul style="list-style-type: none"> Spray Nozzle Chemical disperser OILER – 60 | If the decision to use Chemical disperser is made, then the spray arms are placed on board SKALA PRINOS. | SKALA PRINOS: 2 people |
| <ul style="list-style-type: none"> Absorbent towels Adsorbents (wigs) | Loaded in EPSILON and then transferred to the barge. | Barge: 2 people Diving boat: 2 people Inflatable boat: 1 person |

Whenever facing an event of sea pollution by oil the most important step is containing the pollution (oil spill). Successfully containing the pollution aims at the following objectives:

- Prevents spreading thus preventing coastal pollution.
- The oil concentrates on the sea surface and the thickness of the oil spill increases, resulting in the more efficient use of the Oil Skimmer.

Below are the options to tackle pollution depending on whether the leak has stopped or not.

Table 3.3: Options to use the floating booms

| <i>The leak continues</i> | <i>The leak stopped</i> |
|---|--|
| <ul style="list-style-type: none"> If the incident occurs in the platforms or in the pipeline area then: <ul style="list-style-type: none"> The first thing to do is to spread only 250 meters of the boom to encircle the area to prevent spread of the pollution. If the spread of the pollution is contained, then an additional 250 meters of the boom are used in U shape to collect the greatest possible amount that has leaked from the spot of the incident. In case the incident occurred at the tanker, then 750m of floating boom are used to entrap the tanker (maximum length 250 meters). With the completion of this work 300 meters are used (pallets 3x100 meters) in U shape in order to entrap the greatest possible amount that has leaked. | <ul style="list-style-type: none"> If the incident occurs in the platforms or in the pipeline area, then the boom is spread (250 or 500 meters) in U shape in order to encapsulate the greatest possible leaked quantity. If the incident occurs at the tanker then the boom is spread (250 or 500 meters) in order to encircle the greatest possible leaked quantity. |

Table 3.4: Options to use the oil recovery system

| <i>The leak continues</i> | <i>The leak stopped</i> |
|----------------------------------|--------------------------------|
| | |

| | |
|---|---|
| <ul style="list-style-type: none"> • The recovery in all cases starts from the floating boom that has engaged the most oil. • If it is a tanker and sinking is imminent, then in addition to the above, the company that will empty the contents of the tanker is called. | <p>In this case the same actions are taken as in the left column.</p> |
|---|---|

The average times required for the full mobilization of the personnel from the moment of the activation of the Plan until the start of the anti-pollution tasks are mentioned below.

The area of platforms with the longer activation times is chosen because all the other cases are between the platforms and the Installation.

The times listed are approximate and depend mainly on the time, day (evenings, holidays, celebrations, etc.) the incident is caused, and the current weather conditions.

In the case of the following tables the times were determined during the day, with sunshine (about 20 °C) and lull.

It should be mentioned that immediate action will be undertaken by VALIAN ENERGY vessel which is continuously stand-by at the platforms' area and transfers 250 meters of floating boom. **It will approximately take 30 min to start deploying the floating booms at the pollution area.**

Table 3.5: Estimation duration mobilization during office hours

| Plan Activation Time: 09:00 | | |
|--|-------------------------------|---|
| Action | Time | Notices |
| Transition of the forklift and the trailer truck at the anti-pollution warehouses. | 09:30 | Prerequisite before moving is to safely discontinue the work they performed. |
| SKALA PRINOS vessel arrival at the incident area for observation and action. | 09:45 | Travel time is about the same whether it is in Port of Kavala or the pier. |
| Inflatable boat arrival at the incident area for observation and action. | 10:00 | The transfer from the Warehouse to the pier is achieved with a second forklift |
| Diving board arrival at the incident area for observation and then action. | 10:00 | |
| EPSILON vessel arrival at the installation pier | 10:00 | EPSILON vessel is usually located either at the port of Kavala or the Delta platform. |
| Loading of equipment and materials on trailer truck. | 10:15 | |
| Transition to the pier | 10:25 | |
| Loading the equipment and materials on board EPSILON. | 10:45 | |
| EPSILON arrival at the area of incident | 11:45 | |
| Total Time | 2 Hours and 45 Minutes | |

Table 3.6: Estimation of mobilization duration outside office hours

| Time Activation Plan: 09:00 (Weekend or Holiday) | | |
|--|-------------------------------|---|
| Action | time | Notices |
| Staff Arrival. | 10:15 | |
| Transition of the forklift and the trailer truck at the anti-pollution warehouses. | 10:30 | |
| SKALA PRINOS vessel arrival at the incident area for observation and action. | 10:30 | Travel time is about the same whether it is in Port of Kavala or the pier. |
| EPSILON vessel arrival at the installation pier. | 10:30 | |
| Inflatable boat arrival at the incident area for observation and action. | 11:15 | The transfer from the “Giarda” to the pier is achieved with a second forklift |
| Diving board arrival at the incident area for observation and then action. | 11:15 | |
| Loading of equipment and materials on trailer truck. | 11:15 | |
| Transition to the pier. | 11:25 | |
| Loading the equipment and materials on board EPSILON. | 11:45 | |
| EPSILON arrival at the area of incident | 12:45 | |
| Total Time | 3 Hours and 45 Minutes | |

3.2.2 FACING SEA POLLUTION WITH WIND EXCEEDING 16 KNOTS

To face sea pollution with wind exceeding 16 knots (Beaufort scale 4 the development of booms is avoided for the following reasons:

1. The towing and especially the anchoring of floating booms is difficult because of the waves and that endangers the staff.
2. The effectiveness of booms is reduced by the fact that some amount of pollution escapes the dam due to the waves.

The operations depending on whether the boats can sail or not are separated below.

3.2.2.1 Wind of 16 knots up to a prohibition of sailing issuance

In this case, the actions taken regarding the anti-pollution means, equipment and materials are those of Table 3.1 with the exception of the diving board, the inflatable and the barge LIMIN PRINOS.

The means used (after permission of the Central Port Authority) are associated with the use of the chemical disperser, i.e. the VALIANT ENERGY and EPSILON vessels are used with the spray arms and the SKALA PRINOS with the spray gun and the OILER-60 (see Table 3.2).

The Port Authorities authorize the use of chemical disperser in all cases.

The average time required for full mobilization of personnel from the moment of the activation of the Plan until the time of initiation of anti-pollution operations are identical to those in Table 3.5 and Table 3.6. while VALIANT ENERGY immediate action is taken within 30 min.

3.2.2.2 Issuance of Sailing Prohibition

If there has been a prohibitive then only the VALIANT ENERGY and EPSILON vessels can take part in the fight against pollution in the manner developed in Chapter 3.2.2.1.

Usually, in severe weather conditions, the loading of materials from the installation's pier is not recommended (there is a possibility of injury of the personnel) and for this reason the selected port is Philippos II or the port of Kavala.

3.2.3 COAST POLLUTION

The coastal pollution is caused by the amount of oil that due to environmental conditions (wind direction and speed, tidal currents) is transferred from the area of the incident to the coast. This can happen if:

- Not all the amount is initially trapped when dealing with the incident.
- Some amount escapes from the trapped region by the water dam, due to increased waves.

Immediate priority before starting the coast cleaning is that the pollution combatting has progressed in the sea area of the event, in order to free the technical support machines (semi-trailer truck, forklift, and crane) to be used as indicated below in Table 3.7.

Also, when going to and coming from the area of the incident, the necessary traffic measures are taken and all necessary measures of safety - signs are taken in cooperation with the Traffic.

To face pollution on the coast the following are taken into account:

- The amount of oil on the coast.
- The nature and uses of the coast.
- The depth the oil has penetrated.
- The accessibility of the area by land and sea.
- The potential impact on the broader ecosystem of the shoreline.

Table 3.7: Resources needed to fight coastal pollution

| Required means | Action | Required staff |
|-----------------------|---|---|
| Semitrailer Vehicle | <ol style="list-style-type: none"> 1. Transfers the materials from warehouses to the designated coast. 2. Is ready to transfer additional materials during the tasks. 3. Transfers waste materials and waste from the coast to the facility's Temporal Storage Area. | 1 driver + 1 assistant |
| Loader | <ol style="list-style-type: none"> 1. Assists in opening access roads (if required). 2. Remediate the soil near the coast to facilitate cleaning crews. | 1 operator |
| Forklift truck | <ol style="list-style-type: none"> 1. Loads and unloads materials and equipment to / from the trailer vehicle. | 1 operator |
| Self-propelled Crane | <ol style="list-style-type: none"> 1. Goes in the area of the pollution and loads and unloads materials and equipment to / from the trailer vehicle. | 1 operator + 1 assistant (he is from the trailer vehicle) |
| Off-road car | <ol style="list-style-type: none"> 1. It is used for immediate access to the coast and the monitoring of pollution. | 1 driver + 3 persons portability |

Table 3.7: Materials needed to combat coastal pollution

| Anti-pollution equipment | Action | Required staff |
|--|--|---|
| Absorbent rolls and adsorptive wigs. | Used to capture oil on the shoreline | <ul style="list-style-type: none"> • Personnel for immediate response: 6 people |
| Recovery system using vacuum and a reservoir for storing the recovered liquid. | Used for suction of liquids and solids from soil cavities where the oil is trapped | <ul style="list-style-type: none"> • If the cleaning of coasts requires additional manpower, then these people are leading the created groups. |
| Manual labor tools. | Used to remove the contaminated material and the sand that has absorbed oil | <ul style="list-style-type: none"> • The additional staff is trained on the basic techniques of facing pollution on the coast. |
| Barrels and plastic bags. | Used for contaminated waste | |

The time required for the complete transition of equipment and personnel to the site of occurrence is difficult to estimate.

As mentioned above, the immediate priority is to face the sea pollution and when the loading and transport machinery and the personnel are free, then the coastal pollution combatting begins.

More time is also required in case of moving to the island of Thasos in relation to the area of Kavala to fight coastal pollution.

3.2.4 PROTECTION OF SENSITIVE AREAS

If there is risk of pollution of protected and sensitive areas which will be indicated by the Port Authority, then floating booms are used to protect these areas.

If at the same time more than one sensitive area is threatened, then the Central Harbour Master decides the area priority for the dam placement.

In many cases it is impossible to prevent pollution of the coast and is considered advantageous to divert the spill to a particular area of the coast, where there is easy access to it and the ability to fully use the available equipment for the recovery of spilled oil.

For this reason, the Port Authority of Kavala predefines areas of increased need for protection; these are shown on maps of environmental sensitivity (sensitivity maps) and widely publicized in the local community, in order to avoid divergence of the Authorities and the local bodies during the first critical phase of dealing with any random incident.

3.2.5 POLLUTION COMBATTING WASTE MANAGEMENT

3.2.5.1 Wastewater management

During the operations to face pollution, oily waters are produced:

- Of recovery at sea operations, collected by the vessel VALIANT ENERGY.
- Of recovery at sea operations, collected by the barge LIMIN PRINOS.
- Of recovery in land operations, collected in closed tank and barrels.
- Cleaning of booms and recovery systems and oil recovery, after the end of the operations.

All these liquid wastes are collected and processed in the oily water processing unit within the onshore plan.

3.2.5.2 Management of solid waste

During the operations to face pollution, the following solid wastes are produced:

- Absorbent booms contaminated with oil (absorptive capacity 25 times their weight).
- Absorbent rolls and towels contaminated with oil (absorptive capacity 25 times their weight).
- Adsorbent wigs polluted with oil (adsorptive capacity 65 times their weight).
- Garbage bags used to transport the above.
- Soil and sand contaminated with oil.

All of the above solid wastes are transferred to the onshore Oily Sludge Treatment Plant.

In the Oily Sludge Processing Unit there are three open roof tanks TK-665 A, 665 B-TK and TK-665 C (Figure 6.1), whose construction was made in such a way as to obtain the tightness to the subsoil and the surrounding space.

Picture 3.1: Solid waste storage tanks



The total volume of the tanks is 3.700 m³ and the dimensions are:

- TK-665 A ~ 40,7 m x 11,6 m x 1,97 m.
- TK-665 B ~ 28,95 m x 24,8 m x 1,62 m.
- TK-665 C ~ 29,55 m x 40 m x 1,80 m.

The liquids from the tanks (oiled water and rain water) are pumped to an oiled water collection shaft and then are transferred through a pipe to the Oily Water Collection and Storage Tank TK-661.

The remaining solid wastes that originated from the pollution fighting operations are managed by authorized waste disposal companies.

3.2.6 MAINTENANCE AND EQUIPMENT REPLENISHMENT

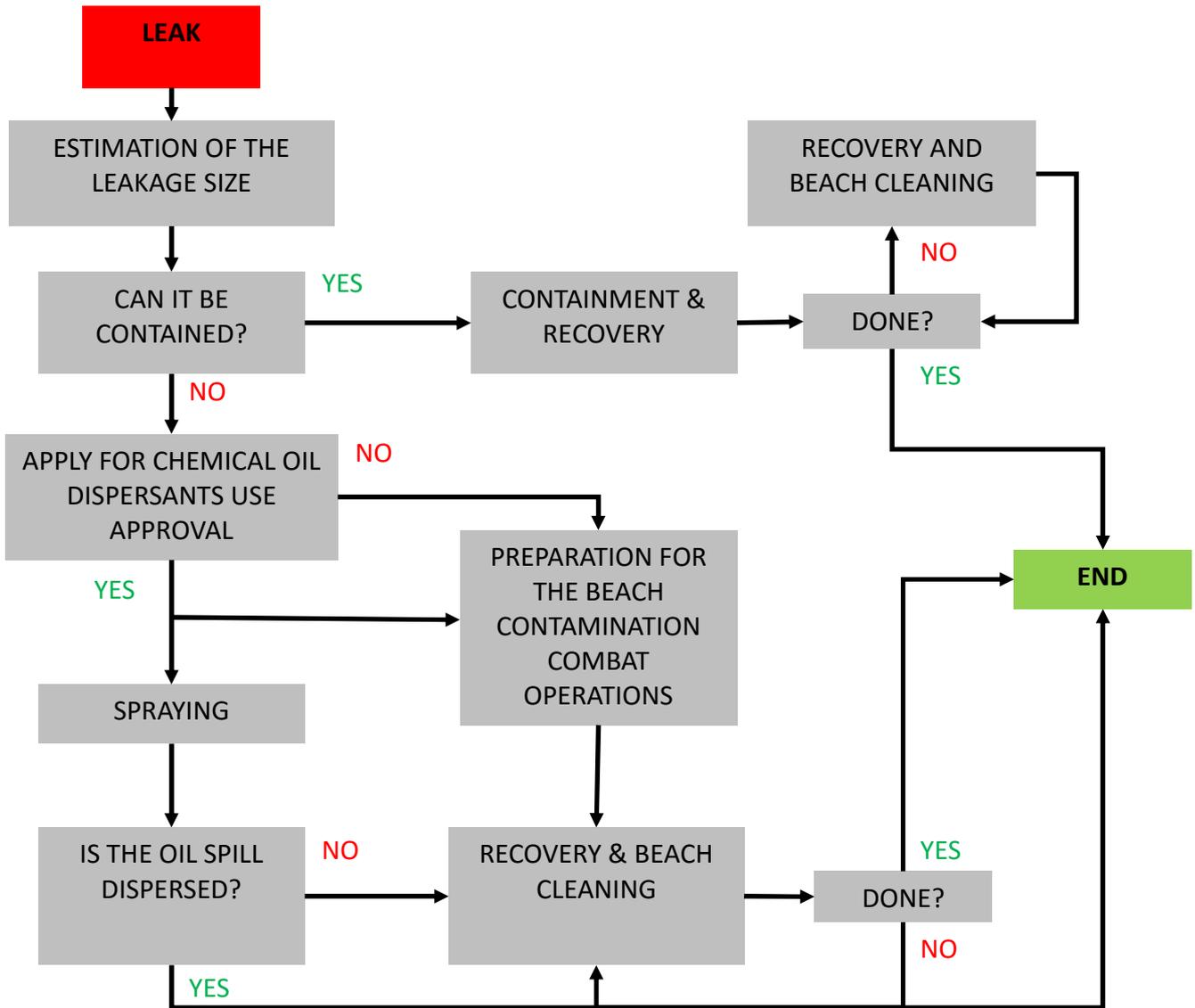
After fighting pollution, the floating boom, the oil collection system, the vacuum collection system, the tools and everything else that was used and is not expendable, is cleaned, maintained and inspected according to the manufacturer's manual.

All the consumables are immediately replenished (absorbent / adsorbent materials, ropes, nautical shackles, tools) as well as materials that have been damaged (parts of the floating boom, recovery systems).

After the maintenance and replenishment of the reserves, all materials are transferred to the storage areas as indicated in images 3.1 to 3.4.

3.2.7 DECISION TREE

The decision tree identifies only the basic data to the decision making flow, from the event of an oil spill to its collection and the coast clean-up that may be required. The experience and judgment of the Coordination Manager and the Planning Team are the main source of the decision making, which are based on data, forecasts and observations of the marine pollution and the weather conditions. The cooperation with the public bodies i.e. for the use of a chemical dispersant is necessary for the timely and efficient protection of the environment and the public interest.



3.2.8 GENERAL REMARKS

The Planning Team has at its disposal computer simulation pollution models according to which the movement of the spill can be predicted by taking into account the weather conditions (wind speed, wind direction and currents)

Apart from the simulation models, the Planning Team assesses the pollution and the effectiveness of the operations by continuous aerial and sea surveillance with the use of aircrafts or helicopters and the Facility's and Port Authority's sea vessels respectively.

It is noted that if confinement of the spill and collection of floating oil is not possible, the use of chemical oil dispersants is considered after permission from the Port Authority.

If marine mammals or other species are in danger of being affected or are affected, the competent bodies are informed by the Coordination Manager.

3.3 ACCOUNTABILITY

All expenses of the Public Sector, the Local Government as well as any other associated bodies that were made to combat pollution, are charged under reasoned decisions of the Kavala Port Authority to the organization responsible for the pollution incident and the jointly responsible, according to the Law.

4 COMMUNICATIONS

The Technical Department drafts a Table with the available telecommunication means (phones, fax, mobile phones, V.H.F., etc.) which are estimated that will be used during the pollution combatting procedures.

The phones and Fax are used to communicate with various Authorities and Bodies.

The available V.H.F. devices are used for the communication of the Coordination Manager with the Intervention Teams and the communications between the Teams.

During the operations the V.H.F. channels of the facility will be used under priority for the needs of the operations.

COMMUNICATION CHANNEL: 14

5 TRAINING – SAFETY DRILLS

All personnel that take part in the operations to combat pollution are trained every year in respect to everyone's duties in the issues of prevention, containment and combatting pollution.

The training levels are:

1. Planning / decision making
2. Coordination / supervision
3. Equipment handling

The persons that will perform level (1) and (2) duties are training under the supervision of the Technical Services Department and in seminars that are organized in specialized centers and international Organizations, Governments, oil companies and the maritime industry.

The Head of Marine Operations of the Technical Services Department trains the Intervention Teams and Technical Support Teams in the implementation of the Anti-Pollution Plan.

The facility performs a general drill with complete mobilization of the available personnel and equipment every year, so as to check every individual function of the Plan (mobilization, communications, decision making, combatting operation, maintenance, cooperation between departments).

After each drill the observations of the involved persons are evaluated and any problems that may arise are documented and in combination with the detailed photographs that are taken, help the Technical Services Department to amend the Plan's implementation and if necessary to revise it.

The HSE Department has the custody and responsibility of the administrative support to drafting and revising the Plan.