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SIMULTANEOUS OPERATION PROCEDURE

TAKREER Project No. : 5578

TAKREER
Ruwais Refinery Expansion Project


DISTRIBUTION	
TAKREER	
SEOUL	
SITE	v
PMC	
SEOUL	
SITE	v
CONTRACTOR	
PROJECT	v
PROCESS	v
PIPING	v
ROTATING	v
STATIONARY	v
ELECTRICAL	v
INSTRUMENT	v
CIVIL	v
ARCHITECTURE	
PROCUREMENT	v
CONSTRUCTION	v
QA / QC	v
HSE	v
IT	v

Rev	Date	Description	Orig by	Chk'd by	App By	COMPANY App
0	12/12/12	For Construction	KO Y. D	Y. H YANG	I.H.Hur	
B	4/12/12	For Approval	KO Y. D	Y. H YANG	I.H.Hur	
A	22/09/12	Issue for Review and Comments	KO Y. D	Y. H YANG	I.H.Hur	

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Revision List
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Rev. No.	Date	Description	Page no.	Remark
A	22. Sep. 12	Originally issued for Review and Comment	All	
B	4. Dec. 12	Incorporation of comments raised by COMPANY	5,9,13 & 16	Done
0	12. Dec. 12	Issued for Construction		




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AGREEMENT

By EPC CONTRACTORS Seal and EPC CONTRACTORS representative signature hereunder attached, it is recognized and covenanted by the Parties hereunder that a formal Agreement has been made regarding the works as described in this Common Water Flushing Procedure. This Agreement has been mutually signed and agreed


	EPC 1	EPC 2	EPC 3	EPC 4	EPC 6	EPC 7
Name						
Position						
Signature						
Date						



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1. Purpose

1.1 Main purpose

The main purpose of the Simultaneous Operation Safety rules and procedures is to provide all personnel involved with simultaneous operations in EPC E&C with knowledge of the relevant safe practices and procedures.

Additionally, this is used to predetermine the compatibility, interference and limitations during the planning and operational stages of simultaneous operations.

It is possible to forecast the equipment lay out, the number of personnel involved and the safety status of a given area for determining Construction or Commissioning operations during routine production.


This will optimize safety clearance, prevent obstructions / interference and minimize Constraints. This is one of the objectives of the SIMOPS procedures.

This document called "Simultaneous Operation Safety Rules and Procedures" are referred to, in short, as SIMOPS.

1.2 Detailed Objectives

The objectives of the SIMOPS are to:

- Highlight potential restrictions when forecasting and planning additional activities due to take place at the same time and at the location where long-term activities are performed. (For the purpose of this document, SIMOPS begins first with utilities i.e. electricity supply)
 - Ensure any activity or operation affecting an area where another activity may be going on simultaneously, is reviewed and analyzed for potential interference or limitation.
 - Establish a mechanism to review proposed activities (e.g. meeting and identifying department participation)
 - Establish matrix to authorize simultaneous activities.
 - Ensure simultaneous activities are controlled and performed in a safe manner, that clearly defines responsibilities of personnel involved
- Stating preventive measures to be implemented prior to starting simultaneous

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activities.

- Limiting the number of simultaneous activities to only the area affected.
- Avoiding interference during operations.
- Providing communication channels and procedures.
- Training of all personnel including communication of step changes.
- Minimize the potential for personnel injury and equipment damage by:
 - Providing specific instruction for securing operations and mustering personnel in case of emergency.
 - Ensuring all personnel involved are aware of the specifics of simultaneous operations and of the procedures.
 - Identifying hazards and evaluating the consequences of failures, to update matrix of allowed simultaneous activities.

2. Scope

This procedure shall outline the philosophy and intent that the project as a whole shall adopt for controlling and managing simultaneous operations and shall be used by all members of RRE Project Management Team, Supervisors and Subcontractors who are responsible to supervise and control hazardous activities within the RRE project scope of works where a permit to work is necessary.

The activities covered by this document are:


- Construction activities (Lifting, Cold work /hot works, etc.)
- Commissioning activities.
- Operation of the utility system and Production activities prior to handing over plant to COMPANY.

3. Operations Forecast and Planning

Construction, Commissioning, Utility systems running and Production Operations with potential interference between them should be forecasted to minimize any interference. Information relevant to simultaneous activities with a possible potential impact to the other team should be given out for every planned operation as well as for contingency and emergency situation.

The groups, Construction, Commissioning & Start-Up and Production, will perform



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operations in the RRE project. The support and contributing elements are as below which are reference to forecast.

- Construction forecast and planning
- Commissioning forecast and planning
- Operation of utility system forecast and planning
- Production activities forecast and planning

4. Responsibilities

4.1 Site Manager

The Site Manager is responsible for the Environment, Safety, Health and Welfare of all personnel working in the construction and commissioning areas. All groups and supervisors working on the project shall assist the Site Manager. Urgent decisions regarding SIMOPS are the responsibility of the Commissioning Manager.

4.2 Commissioning Manager


The Commissioning Manager is responsible to ensure that :

- Environment, Safety and Health requirements of all personnel working in the Commissioning and restricted areas are met.
- All groups and supervisors working on the project shall assist the commissioning manager.
- All operations are carried out by authorized responsible persons and in accordance with the safety procedures under a proper Permit to Work system.
- All personnel working inside the Restricted Areas are made aware of and must comply with this procedure and relevant mustering, evacuation and emergency plans and making ensure that all the necessary means are provided.

The Commissioning Manager takes the responsibility as Simultaneous Operations Leader (**SOL**)

The Commissioning Manager is responsible for proper coordination and safe simultaneous interfaces as well as identification and resolution of possible impact on other operations.

He liaises with all supervisors (Production, Construction, Commissioning, Maintenance, Safety, etc) and area /installation authorities.

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He ensures that the operational teams strictly enforced SIMOPS procedures. However, both Construction and Commissioning teams remain responsible for the safe management of their own operations. In the event of a disagreement regarding the safety of a proposed simultaneous operation or the continuation of an activity in progress, the matter should be referred to the Project Management Aide.

4.3 HSE Manager

The HSE Manager shall :


- Report to the Site Manager.
- Give appropriate HSE guidelines to the commissioning management team and the commissioning area safety supervisor by the HSE Plan for commissioning.
- Ensure that all Site Personnel are appropriately informed on risks associate to other activities in the surroundings and that of the already started up units inside the RRE.
- Support HSE auditing at site regarding the commissioning activities in preparation for Start up through the audit tools.

4.4 Area Safety Supervisor

The area Safety Supervisor shall :

- Provide assistance to the commissioning Manager and HSE Manager with regards to matters related to commissioning.
- Advise commissioning area supervisor of required actions to upgrade any substantial working conditions.
- Ensure that all personnel involved with commissioning activities are aware of the project HSE requirements and are properly trained.
- Conduct regular inspections to verify that the working conditions comply with the HSE requirements as described in the "Commissioning HSE Plan" and that the operations are performed according to the Work Permit Requirements.
- Participate in the investigations and analysis of accidents that occurs in his area of responsibility, if any.



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- Verify housekeeping and waste disposal. Manage the waste streams as described in the "Commissioning HSE Plan"
- Ensure that, all hazardous materials entering at site are provided with appropriate Material Safety Data Sheet.

4.5 Commissioning Area Supervisor

The commissioning area supervisor shall:

- Report to the Commissioning Manager.
- Authorize the Work Permits as approved signatory for his area.
- All works in a unit or area on any equipment shall be carried out under his supervision.
- Ensure that all work are carried out properly in accordance with the safety procedures and requirements under Permit to Work system.
- Ensure that, only essential personnel are authorized to enter areas affected by SIMOPS operations as controlled by *Restricted Access Control Plan*
- The Shift Commissioning Area Supervisor receives the application for the PTW .
- On being satisfied the work being requested is correct , and in order to minimize the hazards to other activities or personnel in the area, he will forward the PTW application to the Commissioning Managers approved PTW signatory for authorization of the PTW. Commencement of work may proceed after the precautions and conditions under which the work must be carried out have been implemented .
- Ensure that, area operators are fully aware of the SIMOPS as well as the implication and consequences of each of their operations with regards to the proximity of other team of personnel and equipment.
- Ensure that, involved personnel are aware of alarms and evacuation procedures and that the all means are provided.
- Ensure that, operations are performed within forecast. In case of delays, the Area Authority should evaluate consequences of the delay and notify the Site Operation leader and other interested parties as required.



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5. Supervision

Safety of SIMOPS operations is dependent on a high degree of communication, coordination and cooperation between the HSE Supervisors and Commissioning Area Supervisor involved.

Detailed evaluation and control of the operational parameters are of prime importance for SIMOPS operations, safety and efficiency.

For this purpose, commissioning shall maintain two sets of permanently up-dated and marked-up copies of electrical online diagrams identifying energized circuits with P & IDs identifying pressurized equipment, location of isolations (spades, spools, valves, etc...).


In this respect, and in addition to the usual job preparation, supervisors shall:

- Ascertain that, their operation has been duly planned and that the Commissioning Manager, Area Supervisor and other involved supervisors have been informed of the timing and about any potential s or conflict.
- Confirm starting time and duration.
- Confirm potential constraints and interference.
- Check that operation and emergency procedures comply with SIMOPS procedures
- Provide equipment that complies with SIMOPS identified hazards and commissioning standards.
- Ensure both, equipment and personnel, are available and comply with SIMOPS requirements. during the operation, direct control should be maintained .
- Continuous supervision and monitoring
- Give clear instruction and constant update on progress of events.
- Enhanced checking and testing.
- Good communication and detailed instructions e.g. Tool Box Talks.

6. Operations Management and Organization

Planning highlights concurrent activities performed by different sections. A general agreement on work organization and schedule is reached to minimize disruption and promote communication between all parties.



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6.1 Operations Planning

Construction and Commissioning Departments issue planning forecasts which are reviewed by respective management to identify Simultaneous Operations. When SIMOPS are identified, Managers will advise all affected parties and when required Construction / Commissioning planning will be updated to incorporate SIMOPS.

6.2 Operation Preparation

Prior to commencing SIMOPS, the SOL will meet with all involved parties to verify aspects of the operation , confirm emergency procedures, identify constraints, limitations and conflicting activities.

Once the planning of the operation is confirmed and the detailed program and/or procedures approved, equipment and personnel may be mobilized.

6.3 Meetings (All meetings shall be minuted)

Meetings are required to:


- Keep the highest standards of Safety awareness for all personnel.
- Ensure proper Communication, Cooperation and Coordination between the different teams working on the installations.
- Ensure proper planning and progress of simultaneous activities to minimize unproductive downtimes.
- Ensure strict application of the Safety rules & procedures and of the risk evaluation and work Permit System.

Meetings will be held:

- Prior to start-up of simultaneous activities :
All supervisors to be convened to a kick-off meeting by the Site Manager, SOL, to ensure that all precautions have been implemented and equipment is available.
- Daily
Time and location to be agreed on by the Commissioning Manager /SIMOPS Lead.

In addition to usual topics and tasks, this meeting chaired by the SOL is opportunity for supervision personnel to:



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- Review and confirm planning of future simultaneous activities, according to actual progress of running operations and to identify potential conflicts.
- Authorize work to be performed PTW highlighting SIMOPS events and address safety concerns.

Daily

- Tool Box Talks.

Specific emphasis shall be given to the systems having a potential impact on commissioning activities in hand and methods of raising the alarm to be taken in case of emergency. These may have to be changed to adapt to the SIMOPS context:
e.g.:

- Areas barricaded off or temporarily used for a different purpose
- Escape routes, location of safety equipment

Emergency drills:

Shall be conducted in the context of simultaneous activities.

6.4 Information and Training

As described in the Commissioning HSE Plan (Doc.No.: 5578-E3-HSE-HU-00037) – HSE Training” all Site Personnel will, upon arrival, receive HSE training from Contractor according to the Training Matrix as Attached (See Attachement-1: Training Matrix), in addition to the knowledge acquired in advance by their respective Employers.

Site Manager is accountable for ensuring HSE training is done. The HSE Manager shall ensure that all Site Personnel receive the following information and training as a minimum requirement according to the Training Matrix as below.

The HSE Manager shall keep the record of the training sessions at Site duly signed by all the attendees.


7. Restricted Areas

Prior to the start up, the unit should be clearly isolated with fence in line with the startup sequence to restrict any unauthorized persons and vehicles entry to the commissioning area.

The site will be isolated by the existing fence.

Basically the safety measures shall be taken as mentioned below before introducing the gas in the unit and during commissioning stage.



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Unnecessary facilities such as containers, storage rooms and equipment in the site will be removed (only some facilities for commissioning will be allowed to be placed at the designated area in the site (refer to the DOC. NO: 5578-E3-HSE-HU-00043 : attached 1/2/4)).

- Area & unit will be isolated with temporary fence in line with start up sequence (refer to the DOC. NO: 5578-E3-HSE-HU-00043 : attached-1/2/3/4)
- Vehicles entry will be controlled at the main gate & Peoples entry will be controlled at the entrance of the commissioning units (the vehicles/ equipment certified with the entrance certificate)
- Live lines will be isolated with a blind and attaching with tags.
- Security positioned (confirm PTW & maintain a log sheet)
- Utility Sewer System will be isolated from operating and non operating unit
- The area or unit which will perform special activities for commissioning shall be barricaded with blue & white barricading tape, and warning signs.

Facility isolation

The process areas and Flare & Tank area will be divided into each two cases. In case of process areas, partially operation and all unit operation case and then, Pilot burner firing and gas feed- in case for the Flare & Tank areas.

The units will be isolated in the line with start -up sequence mentioned above (refer to the DOC. NO: 5578-E3-HSE-HU-00043 : attached- 1/2)


If there are any equipment and valve station of ISBL to be serviced with gas or utility in the unit under construction will be isolated with fence. (For more details please refer to the DOC.

NO: 5578-E3-HSE-HU-00043 :)

Within the Production Areas, personnel, equipment, tools etc. will be controlled at the each unit check point by Access control Personnel

Restricted Areas shall be under Work Permit system. **Certain routine tasks, which do**



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not create any potential hazard to personnel, equipment, or the Site, will not require Permit. Such tasks shall be listed by the Commissioning Manager (SOL) for the areas under control.

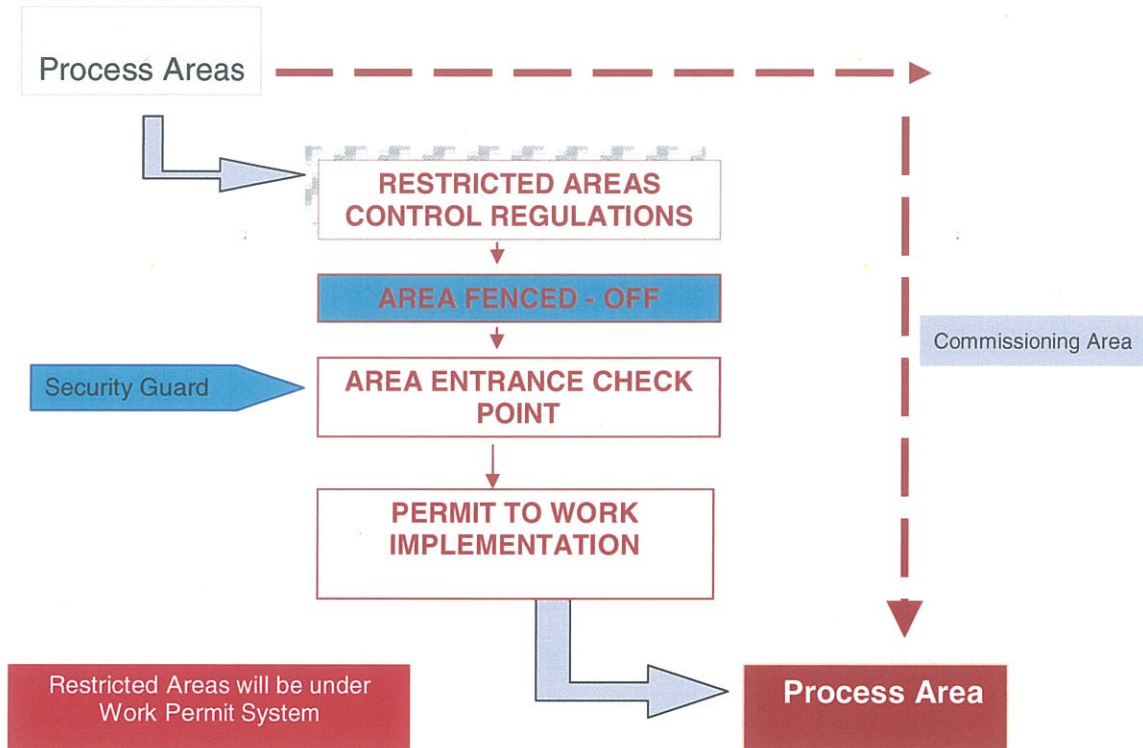
In addition, there are some shared Areas:

- Personnel from both operations must be present at the same time at the same place before work task is been carried out.
- Operations will be performed in close proximity of personnel with potential hazards such as pressure testing and gas release whereby safety barriers may not provide suitable protection due to the confined environment (the minimum distance required may not always be practicable)
- Areas where control, emergency and safety equipment in use for production are located.
- Areas where Safety equipment, communication devices (telephone line) are located.
- Escape routes and Muster Points.
- Areas through which live or pressurized lines pass.
- A separate parking zone will be arranged for parking the vehicles in the site, if vehicles
- are required entering inside the gate. (refer to the DOC. NO: 5578-E3-HSE-HU-00043 : attachment-1/2)

General Requirements for the Areas Going under Commissioning & Start-Up Phase



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7.1 Work Permit System

Work Permit System Doc. No. 5578-E3-HSE-HU-00042 is applicable for SIMOPS on the Worksite.

The PTW shall be in compliance with COMPANY operational PTW COP.


The following are the classifications of PTW:

- Cold Work
- Hot Work
- Confined Space Entry
- Electrical Work
- Excavation Work
- Handling of Radioactive Sources
- Mobile Vehicle & Machinery Entry
- Road Closure Excavation Work
- Easement Work and *Isolation Confirmation Certificate*

7.2 Plant and Equipment Control

All existing plant and equipment and new purchased equipment must conform to



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hazardous area classification, other plant and equipment will be subjected to and controlled by the Permit to Work System.

Examples will include but are not limited to:

- Vehicles
- Electrical equipment
- Power tools
- Intrinsically safe communication system
- Lifting equipment
- Hand tools

All plant and equipment for use within controlled areas (i.e. live) will be subject to pre inspection, plant ID cards and tagging

Personal protective equipment and escape equipment must be suitable for use within a sour (H₂S) service environment.

The all battery operated equipment will be certified EX explosion proof by Electrical HSE S/V

Vehicle Access Procedure

All vehicles entering the Production Area must have diesel engines.

This is considered as the basic safety requirements during the Production Phase.

Access control will continue during the normal plant operations after the construction activities are completed.

All movement of vehicles within the Production Access Controlled Area must be in accordance with the rules and requirements.


Access to the Production Areas by vehicles during the SIMOPS Phase must be minimized, and will only be allowed with a permit valid for a day only.

Any vehicles that may require entering in, or leaving the access roads of any units within the Production Areas, for construction or maintenance purposes, will require a special entry permit issued by the Area Supervisor of the relevant area. Without this permit, entry to and exit from the access roads to the units are strictly forbidden. Fence will be installed in the line with start -up sequence (For more detailed see the section 4.3/4.4 of the DOC. NO. : 5578-E3-HSE-HU-00043 RESTRICTED AREA CONTROL PLAN)

7.3 Personnel Control

Access to the Restricted Areas will be controlled and managed by Pass Card, manned security, and the permit to work system.



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- No workers is allowed to enter and work inside the Restricted Areas without Work Permit and approved access.
- Only those whose names are written on the permit can go in.
- Visitors to these areas will be hosted at all times by a member of RRE authorized personnel and only with written consent from the HSE Manager.
- Other than Area and Shift Operators, Fire and Safety personnel, any person wishing to enter the Restricted Areas shall obtain written permission from the HSE Manager and shall be accompanied by a member of the area authorized personnel.
- Every one shall have proper PPE.
- Smoking is forbidden, no lighter, no matches, no cigarettes etc...
- All Battery operated equipment must be certified EX, explosion proof (intrinsically safe).
- All warning signs shall be prepared in English.
- Fence off the unit with warning signs such as
 - Under Commissioning (No Access)
 - No Unauthorized Entry etc..

It is essential that all personnel conform to this procedure. The objective is to ensure that in the unlikely events of a plant emergency, all persons in the Restricted Areas can be accounted for and immediate action can be taken to rescue missing persons.

During emergencies, emergency response Team and vehicles (Fire trucks, Ambulance, etc.)

Shall be covered by vehicle access procedure p15; rule No:1.

Note: For more details for personal control see section 4.0 of Restricted Area Control Plan.


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8. Mustering and Evacuation

8.1 Objective

All works and permits are automatically suspended on the raising of any Emergency



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Alarm.

Only when the situation is back to normal may the work be resumed. All permits shall be reindorsed

Whenever mustering personnel is required, all construction / commissioning and operation personnel will normally muster outside the potentially impacted area in the Muster Points.

This section is provided to make all personnel aware of the actions they must take on hearing the Emergency Warning Alarm or on activation of local audible and visual alarms. This procedure provides advice on when personal safety equipment should be fitted to ensure that personnel reach the most appropriate Muster Point in a safe manner.

All other matters relating to actions and responses that should be carried out in an emergency by the essential personnel are covered by a separate document, Emergency Response Plan (Doc. No. 5578-E3-HSE-HU-00044

All personnel working in the Restricted Areas (production areas) must comply with this section and have an individual responsibility for:

- Wearing all appropriate Personal Protective Equipment (PPE).


8.2 Procedures

In the event of an incident, personnel will need to be vacated from the immediate vicinity. To where will be dependent on the severity of the incident and can be described in three levels:

- i) Vacate - Vacate is defined as immediately leaving the vicinity of the hazard or incident within a unit. This is required when an incident only has the potential to affect personnel in the immediate vicinity and is contained.
- ii) Muster - Muster is defined as personnel gathering in designated Muster Points to allow all personnel to be accounted for. Mustering is required when an incident has, or has the potential to, spread outside the immediate vicinity (fire zone) affecting a large number of personnel.
- iii) Evacuation - Evacuation is defined as leaving the Muster Points to a new place of Safety. Evacuation will be required if the personnel are potentially in danger at the respective Muster Points. Evacuation will only be directed by the Emergency Response Team.

Personnel must not use vehicles to Vacate an area or when proceeding to Muster Points. Vehicles must be turned off and personnel must walk when vacating a unit or fire zone, or when mustering.



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During the SIMOPS phase, non-diesel vehicles may have to be used in the Production Controlled Areas. All vehicles in these areas must therefore be switched off immediately if there is a local gas release alert. All vehicles on the whole site must be stopped and switched off immediately, and all Hot Work in the Construction area must be stopped immediately, if the Warning Alarm is activated.

8.2.1 Vacate and Muster

Personnel shall vacate an area when alerted that an incident has taken place in the immediate vicinity.

That may be through local audible and visual alarms in a fire zone, audible alarms in internal areas or when they are alerted to a hazard by the audible Emergency Warning Alarm, all personnel within the plant perimeter shall muster either, or as instructed by a member of the Emergency Response Team.

The emergency warning alarm will be activated with wailing tone for 1 minute.



8.2.2 Evacuation

The decision to evacuate the RRE will be the responsibility of the Emergency Response Team.

Evacuation will remove personnel from the impacted area of the Plant, and any other Plant related incidents, to a new place of Safety.


The Evacuation will be decided by the warning alarm and the instruction of Emergency Response Team including evacuation means and route.

Evacuation Procedure shall be detailed in the Commissioning ERP

8.2.3 All Clear Alarm.

This type of alarm is straight in sound for a period of one minute and only used when the emergency area is inspected, fully satisfied and guaranteed that, the plant area and equipment are safe for normal work to resume.




 <p>تكرير TAKREER شركة أبوظبي لتكرير النفط We Refine Right</p>	COMMON PROCEDURE				SK E&C GS E&C SECL DAEWOO ZUBLIN
	SIMULTANEOUS OPERATION PROCEDURE				
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9. References

- Permit To Work Procedure (DOC. NO.: 5578-EA-HSE-HU-00042)
- Restricted Area Control Plan (Doc. NO. : 5578-EA-HSE-HU-00043)
- Emergency Response Procedure (Doc. NO. : 5578-EA-HSE-HU-00044)

Attachment-1 : Training Matrix

Course	Site Audience	Remarks
Induction	All	PPE, housekeeping, Basic lifting & rigging, EMG response etc..
Chemicals & Hazardous Substances Handling	All	Character of hazardous material used, Handling, Use, Storage, MSDS, specific PPE, etc..
Pressure Testing Safety	All	Purpose, procedures, safety requirements
Accident / Incident Reporting	All	Purpose, reporting, classification of accident/incident, Risk Assessment Matrix etc..
Permit To Work System	Relative People (Operation, Maintenance, S/V etc)	Philosophy, Organization, Procedures Types and Formats
Confined Space Entry	Relative People (Operation, Maintenance, S/V etc)	Definition, safety requirement, Atmospheric Monitoring & Testing. Work Permit for entry, EMG response During entry.

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H2S&N2 Hazards Awareness	All	Character, effect on personnel, toxicity, evacuation with PPE, etc..
LOTO procedure	All	Definitions, isolation procedure, lockout device and tags, etc..
Restricted area control procedure	All	Philosophy, Procedures, safety requirements, etc..
Electrical safety procedure	All	Basic electrical safety
Basic fire fighting	All	Basic Fire Fighting, Fire protection sys., Fire extinguisher training, Fire detecting sys., Manual call points, fire alarm etc..
Use of breathing apparatus (SCBA)	Relative People	How to use & maintain, application
Defence driving	Drivers	Vehicle equipment prepared, inspection & maintenance, defence driving, driving safety etc..