

SPD0051ERN

PROCESS DESIGN MANUAL

HEALTH AND DESIGN SAFETY
SPECIFICATION

REV. : 2
DATE : 2013. 06. 25



**SAMSUNG
ENGINEERING**

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1.0 INTRODUCTION

1.1 Scope

The Project HSE Plan defines how SECL will discharge its responsibilities with respect to a body of HSE requirements.

This document forms part of the [Project](#) HSE Plan and describes the activities to be undertaken by SECL to fulfill its design role as far as Health and Safety is concerned.

All work undertaken by SECL and its subcontractors will be carried out in accordance with the guidelines in the overall SECL HSE Policy. The SECL HSE Policy refers to the Project's Safety Management System which is described in more detail in the SECL Health and Design Safety Plan (this document) and the SECL Environmental Management System which is described in more detail in the SECL Environmental Specification.

2.0 Approval of Technical Documents

In order to ensure that only appropriate and competent personnel approve technical documents, and perform some other duties, SECL will issue an Authorized Engineers List for this project. These engineers will be authorized by the corporate management of the SECL.

The Design Safety Supervisor will issue and update this List of Authorized Engineers who will review and approve all technical documents. This approval is to ensure that the design of the facilities is checked and approved by "competent persons", and is quite separate from the authorization of Managers to approve commercial documents. Authorized Engineers are generally selected from those who are principal or chief engineers.

3.0 Health in Design

The all facilities will be designed to minimize occupational health risks by eliminating or minimizing exposure to toxic substances, noise, radiation, etc. that are injurious to health

3.1 Toxic Substances

Asbestos or asbestos containing products will not be [used for construction or otherwise the project, risk assessment](#) will be prepared by the construction subcontractors, and reviewed by SECL.

SECL will specify in the HSE Instructions for suppliers and Sub-contractors, that any suppliers or contractors who provide any substance that may be harmful to the health of anyone who construct or operates this plant, shall provide Material Safety Data Sheets.

These Material Safety Data Sheets shall contain full details of the hazardous substance, specify the precautions that must be taken for the safe use of the substance, the first aid and medical advice needed in case of an accident.

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3.2 Air Pollutant

Special consideration will be taken to minimize the risk of exposure of personnel and impact to the environment from the discharge of air pollutant.

The facility will be designed within appropriate national regulation and international guidelines for air quality exterior to the facility boundaries not to exceed the allowable emission.

Stake heights from large combustion equipment and flares will be assessed by way of dispersion modeling to ensure that the air quality is suitable during the operations phase.

3.3 Noise

The facilities will be designed to comply with criteria for facility noise levels set out in the Basis of Design. All equipment will have the restrictions on the level of noise that will be stated in the relevant material requisition. Noise levels will be minimized in accordance with project specification.

3.4 Protection against Vermin

Design of all buildings, especially temporary facilities, will take into account the need to safeguard the facilities against all pests and carriers of disease.

4.0 Ergonomics

An Ergonomics Coordinator will be appointed to prepare the Ergonomics documentation and to oversee the implementation of the ergonomic aspects of the design of the facility. In addition there will Ergonomic Champions in each Engineering Discipline to ensure that ergonomic factors are taken into account in their area of responsibility.

4.1 Ergonomics Documentation and Training

Refer to SECL Ergonomics Procedures for details of the documents and the training to be undertaken.

4.2 Ergonomics Reviews during Model Reviews

Ergonomics Reviews will be scheduled as soon as preliminary Plot Plans and layouts begin to be available. They will need to be attended by Client's Operating Personnel and will involve a detailed discussion of the operation and maintenance of each unit.

It has been found by experience to review the human factors of the plant during Model Review is the most effective way in consideration of ergonomics in plant design.

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5.0 Safety in Design

The Hazards and Hazardous events will be systematically identified and documented along with the development of the project.

5.1 [Initial](#) Design Phase

The following Hazard Identification Reviews will be required during the [initial](#) design phase of the project.

HAZID Review

The HAZID ([Hazard Identification](#)) Review will take place early in the design stage of the project to [identify potential hazards of](#) the overall facilities.

HEMP Studies

HEMP (Hazards and Effects Management Process) studies will be carried out on each individual unit first to identify the potential HSE hazards, and then to analyze significant HSE issues. The issues identified will be evaluated using the Risk Assessment Matrix and the items that fall in the grey or black area of the matrix will be studied in more detail, in the construction phase, to ensure that adequate barriers and mitigation is, or will be, in place. For more details see the SECL HEMP Procedure.

ALARP Reviews

ALARP reviews will be carried out to ensure that the major risks are reduced to As Low As Reasonable Practicable. For more details see the SECL ALARP Procedure.

Ergonomics Reviews

The Ergonomics Reviews will be chaired by the Ergonomics Coordinator and will follow the SECL Ergonomics Review Procedure.

5.2 Detailed design and construction Phase

The following Hazard Identification Reviews will be required during the detailed design phase of the project.

HAZOP Study

SECL will appoint HAZOP Chairmen (or appointed by the client) and they will follow [SECL or Project](#) HAZOP Procedure. This procedure provides [a structured methodology to identify all possible deviations from which a design is intended to work and all the hazards associated with those deviation.](#)

A Design Safety Engineer will be responsible for monitoring the implementation of the actions into the design of the facility.

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SIL Assignment Study

SECL will appoint SIL Chairmen (or appointed by the client) and they will follow SECL or Project SIL Assinment Procedure. This procedure provides the methodology to determine the target safety integrity level for each safety loop function of SIS design required by safety life cycle of IEC 61511.

Plot Plan and Hazardous Area Classification Reviews

These reviews will be carried out following the requirements of [SECL or the Project Specific Procedure](#).

Constructability Reviews:

These will be carried out following the requirements of [SECL or the Project Procedure](#).

Final Safety Review:

These will be carried out during the detailed design phase, before Process Engineering Flow Scheme (PEFS) are issued for construction. The final safety review is to ensure that all relevant HAZOP actions have been closed out, and that there have been no significant changes to the PEFS that would necessitate an additional HAZOP Study to be carried out.

6.0 Performance Monitoring

6.1 Files and Records

The Design Safety Engineer shall maintain a set of Design Safety Files and its contents are still to be agreed.

6.2 Monitoring the Closeout of Actions

There will be a Hazard Register and HSE Action Register to monitor the close out of HSE related actions.

7.0 Design Safety Audits

General design safety audit will be carried out by the design safety engineer.

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8.0 REVISION HISTORY

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0	2004. 7. 1	All	- Newly prepared as HSE management - Original Dept. : Process Engineering Team - Prepared by : Henry Sung - Checked by : Jae-chul Ro, Jong-Heon Park, Eui-Duk Lee - Approved by : Chan-Sul Jung
1	2010. 11. 20	All	Document number revision - Prepared by : J.I. Kim - Reviewed by : H. Sung, J.C. Ro, H.H. Kwak, M.H. Oh, S.U. Hong - Approved by : E.D. Lee
2	2016.06.25	All	Revised as regular update - Prepared by : D.Y. Min - Reviewed by : W.H Cho, D.W.Kim - Approved by : S.B. Lee