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|  DM--SD-TBSIDDH09- System Description H09 Transport.docx |
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# Introduction

## Purpose of the document

System Description for H09 Transport is a description and rationale of the expected operations of the Transport Systems in H09 buildings and is part of the technical baseline.

It is a platform for stakeholder consensus to ensure the system that is built is operationally feasible.

The System Description for H09 Transport is a sub document to H09
General document [1]

System requirements to the H09 Transport are listed in the document [2].

## Definitions, acronyms and abbreviations

|  |  |
| --- | --- |
| Abbreviation | Explanation of abbreviation |
| CFH09NSS | Conventional FacilitiesWaste Treatment FacilityNeutron Scattering Systems |
|  |  |

# System Purpose

The Transport systems within H09 consists of 7 overhead cranes, one wall mounted robot arm and one battery charged fork lift.

|  |  |  |
| --- | --- | --- |
| Room | Type | Capacity |
| H09.089 Overhead Crane Hall | Overhead Crane | 20 tons |
| H09.089 Overhead Crane Hall | Battery charged Fork lift | 5 tons |
| H09.090 Sorting  | Overhead Crane | 5 tons |
| H09.90 Sorting | Wall mounted robot arm | 500 kg |
| H09.125 Hot Works | Overhead Crane | 5 tons |
| H09.128 Pump | Overhead Crane | 2 tons |
| H09.133 Grouting | Overhead Crane | 5 tons |
| H09.137 Cementation | Overhead Crane | 2 tons |
| H09.91 DecontaminationH09.124 MaintenanceH09.099 Nuclide Characterisation | Shared Overhead Crane | 5 tons |

The transport equipment in H09 building shall essentially support and enable daily work, logistic and to enable the implementation of necessary maintenance and repair work on machinery, tools, components and instruments etc.

# Concept of operations

## System Stakeholders

|  |  |  |
| --- | --- | --- |
| **Stakeholder** | **Stakeholder group** | **Representing stakeholder** |
| NSS | Users |  |
| Operators |  |
| CF | Regulators | Swedish civil Contingencies AgencySwedish Work Environment Authority (Arbetsmiljöverket) |
| Operators | Facility management provider |

## Life cycle

Life expectancy of the transport equipment is at least 20 years but ESS is expected to be in operation for 40 years. The equipment shall be constructed so that modernization and required updates can be performed to extend the service life by another 20 years.

## Context & interfacing systems

The Transport system shall be functioning in +5°C to +40°C.
Transport system has the following interfaces.

Building H09 provides the cranes with necessary columns/supports for runway, barriers and gates for protection against falling etc.

Electricity supplies cranes with electric power. C&M monitors technical alarm signals from the cranes.

Figure 1: Context diagram H09 Transport

### Compliance with standards

### 3.3.1.2 Standards for Cranes

BFS 2015:6 EKS 10 Building and planning regulations to amend the Agency's administrative provisions and general guidance (2011:10) on the application of the European construction standards (Eurocodes).

SS-EN13001-1:2015, Cranes-General design-part 1: General principles and requirements.

SS-EN13001-2:2014, Crane safety- General design-part 2: Load actions.

SS-EN13001-3-1:2012+A1:2013, Cranes-General design-part 3-1 Limited States and proof competence of steel structure.

SS-EN 13001-3-2:2014, Limit states and proof of competence of wires ropes in reeving systems.

SS 764 30 03 Cranes and lifting Appliances-Mechanisms-Design.

SS-EN13135:2013, Cranes-safety-design-requirements for equipment.

SS-EN 13557+A2:2008, Cranes-Control and control stations.

Machinery Directive 2006/42/EC 2nd Edition June 2010

SS-EN 61000-6-2 +C1, Electromagnetic compatibility (EMC) Part 6-2: Generic Standards-Immunity for industrial environment.

SS-EN 61000-6-4 +A1, Electromagnetic compatibility (EMC) Part 6-4: Generic Standards-Emission standards for industrial environment.

ELSÄK-FS 2008:1 including amendments according to ELSÄK-FS 2010:1 and ELSÄK-FS 2015:3.

ELSÄK-FS 2008:2 including amendments according to ELSÄK-FS 2010:2.

ELSÄK-FS 2008:3 including amendments according to ELSÄK-FS 2010:3.

ELSÄK-FS 2008:4 and general guidance of the applications ELSÄK-FS 1999:5

SS 436 40 00 Edition 2.

### Environmental, Health, Safety and Security

In general, energy-efficient systems should be selected. Appliances and wiring should be lead-and halogen-free, environmentally harmful substances/emissions shall be avoided.

Sustainability according to “CF Sustainability Requirements” [3].

Energy Efficiency guideline, BREEAM ENE 06- Energy efficient transport systems [4] will apply.

Fire rating of doors [5] and fire operation functions.

Shielding according to EMC-directive.

The transportation of dangerous goods between the different producers to H09 follows the guidelines in [6].

### Radiological safety important system parts-

# System characteristics

|  |  |  |
| --- | --- | --- |
| **Name and location** | **Type** | **Capacity** |
| H09-089:C01Overhead Crane Hall | Overhead crane | 20 tons |
| H09-128:C02Pump room | Overhead crane | 2 tons |
| H09-128:C03Grouting room | Overhead crane | 5 tons |
| H09-090:C04Sorting room | Wall-mounted Robot arm | 500 kg |
| H09-090:C05Sorting room | Overhead Crane | 5 tons |
| H09.125:C06Hot Works room | Overhead Crane | 5 tons |
| H09-091, 124, 099:C07Decontamination room, Maintenance Workshop, Nuclide Characterisation | Overhead Crane | 5 tons |
| H09-137:C08Cementation room | Overhead Crane | 1 tons |

 Functions and requirement are stated in the specific document [6], describing the interface between NSS and Site Infrastructure regarding transport to the H09 building.

For minimum hook coverage see [7] [8] [9] [10] [11] and [12].

* 1. **System functionality overview**

|  |  |
| --- | --- |
| **Name** | **Main Purpose** |
| H09-089:C01Overhead Crane Hall | The Overhead crane’s main purpose is loading and unloading of heavy equipment. |
| H09-089:C01Overhead Crane Hall | The Overhead crane’s main purpose is loading and unloading of heavy equipment. |
| H09-128:C02Pump room | The Overhead crane’s main purpose is enabling service of the pumps. |
| H09-128:C03Grouting room | The Overhead crane’s main purpose is lifting and transporting of heavy equipment. |
| H09-090:C04Sorting room | The wall mounted Robot arm’s main purpose is to sort radioactive material in their respective container. |
| H09-090:C05Sorting room | The Overhead crane’s main purpose is lifting and transporting of heavy equipment. |
| H09-091, 124, 099:C06Decontamination room, Maintenance Workshop, Nuclide Characterisation | The Overhead crane’s main purpose is lifting and transporting of heavy equipment. |
| H09-137:C07Cementation room | The Overhead crane’s main purpose is lifting and transporting of cement bags (1 ton) and enabling filling of cement in the cementation equipment. |

# Risks

# Locations



Fig 2 Crane locations on plan 100



Fig 3 Crane locations on plan 110

# References

|  |  |
| --- | --- |
| [1]  | [ESS-0047239](https://chess.esss.lu.se/enovia/link/ESS-0047239/21308.51166.24832.31373/valid), DM--SD-TBSIDDH09-System Description H09 Waste Treatment Facility.  |
| [2]  | [ESS-0082507](https://chess.esss.lu.se/enovia/link/ESS-0082507/21308.51166.25856.9626/valid), DM--SR-TBSIDDH09- System Requirements H09 Transport.  |
| [3]  | ESS-0031401, EN--AA-MAQU------CF Sustainability requirements.  |
| [4]  | ESS-011548 1 EN--AA-MAEN------ESS BREEAM manual Int 2013 3 Ene.  |
| [5]  | ESS-0002381, BR01DT-TBSIGDPS--Fire Safety Strategy Report.  |
| [6]  | ESS-0122078, ESS Guideline in External/Internal Transportation of Dangerous Goods.  |
| [7]  | [ESS-0129198](https://chess.esss.lu.se/enovia/link/ESS-0129198/21308.51166.3072.16127/valid), H04-78---1-H09100001.dwg and [ESS-0129194](https://chess.esss.lu.se/enovia/link/ESS-0129194/21308.51166.3072.18320/valid), H04-78---1-H09100001.pdf Hookprint H09-089 C01.  |
| [8]  | [ESS-0129195](https://chess.esss.lu.se/enovia/link/ESS-0129195/21308.51166.19456.24361/valid), H04-78---1-H09100002.dwg and [ESS-0129192](https://chess.esss.lu.se/enovia/link/ESS-0129192/21308.51166.52224.31685/valid), H04-78---1-H09100002.pdf, Hookprint H09-128 C02 and H09-133 C03.  |
| [9]  | [ESS-0129193](https://chess.esss.lu.se/enovia/link/ESS-0129193/21308.51166.3072.38674/valid), H04-78---1-H09100003.dwg and [ESS-0129196](https://chess.esss.lu.se/enovia/link/ESS-0129196/21308.51166.35840.37152/valid), H04-78---1-H09100003.pdf Hookprint H09-090 C04 and H09-090 C05.  |
| [10]  | [ESS-0129200](https://chess.esss.lu.se/enovia/link/ESS-0129200/21308.51166.59392.20253/valid), H04-78---1-H09100004.dwg and [ESS-0129197](https://chess.esss.lu.se/enovia/link/ESS-0129197/21308.51166.3072.21064/valid), H04-78---1-H09100004.pdf Hookprint H09-125 C06.  |
| [11]  | [ESS-0129202](https://chess.esss.lu.se/enovia/link/ESS-0129202/21308.51166.59392.8641/valid), H04-78---1-H09100005.dwg and [ESS-0129191](https://chess.esss.lu.se/enovia/link/ESS-0129191/21308.51166.35840.18783/valid), H04-78---1-H09100005.pdf, Hookprint H09-099, 124 and 091 C07.  |
| [12]  | [ESS-0129201](https://chess.esss.lu.se/enovia/link/ESS-0129201/21308.51166.26624.56698/valid), H04-78---1-H09110006.dwg and [ESS-0129199](https://chess.esss.lu.se/enovia/link/ESS-0129199/21308.51166.768.30547/valid), H04-78---1-H09110006.pdf, Hookprint H09-137 C08 |

# Document Revision history

Review comments to this document are made in ESS-0153938

| Version | Reason for revision | Date |
| --- | --- | --- |
| 1.0 | New document | 2017-07-18 |
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