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|  |
| Work and Safety Coordination Plan (WSCP) |
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|  |

|  | Name | **Role/Title** |
| --- | --- | --- |
| **Owner** | Frithiof Jensen | ESS System Leader of Accelerator Electrical systems |
| **Authors** | Frithiof Jensen  Dennis De Wit  Manuel Brand | ESS System Leader of Accelerator Electrical system  ESS Area Supervisor of G01 accelerator tunnel  Service Manager Pentair |
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| **Approver** | John Weisend II | ESS STS Group Leader |

**Diffusion list (for information):** First/Last Name, First/Last Name, First/Last Name, First/Last Name.

|  |  |  |
| --- | --- | --- |
| Work and Safety Coordination Plan (WSCP) | | |
| ESS accelerator installation  INstallation of 19” racks and Containment, cooling water distribution piping in the Gallery (G02) | | |
| **Purpose:**  This Work and Safety Coordination Plan (WSCP) is a contractually binding document and shall be implemented by the ESS staff, their relevant In-Kind Contribution (IKC) partners and/or contractors.  The main purpose of that document is to identify the list of preparatory and organizational measures required prior to the start-up of the installation activity to be carried out by the contractor, as well as the list of associated hazards and safety control measures to be implemented.  The WSCP shall be subject to adjustments and updates adapting to the on-going ESS accelerator installation activity. | | |
| traceability | | |
| **Role** | **Signature** | **Date** |
| **Group Leader**  John Weisend, AD/STS |  | yyyy/mm/dd |
| **ESS Safety Representative(s)**  Duy Phan, AD/Safety |  | yyyy/mm/dd |
| **Area Supervisor**   * + 1. Dennis de Wit, AD |  | yyyy/mm/dd |
| **ESS System Leader**  Frithiof Jensen, AD/STS |  | yyyy/mm/dd |
| **Contractor Representative**  Manuel Brand |  | 2017/10/12 |
| The ESS System Leader is responsible for the redaction of the WSCP, its update relevant to the system of his/her responsibility, and its distribution to the signatories of this document.  Note that the WSCP shall be filled in English.  The ESS System Leader shall also archive and update this WSCP in CHESS[[1]](#footnote-1).  The Contractor Representative is responsible for the distribution of this WSCP:   * To the Health and Safety responsible of his company/institute; * To his sub-contractors; * To all relevant bodies that the company/institute shall report to. | | |

At the initiative of European Spallation Source ERIC and in order to ensure coordination and safe execution of the contract or activity, this WSCP is established:

**Between:**

|  |  |
| --- | --- |
| European Spallation Source ERIC |  |
|  |  |
| * Address: | Box 176, 221 00 Lund, Sweden |
|  |  |
| * Represented by: | John Weisend |
| Division/Group: | AD/STS |
| Acting as: | Group Leader on behalf of the Division Head |
|  | Tel: (+46 46 888 xxxx)  Mobile: (+46 72 179 xxxx) |
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|  |  |
| * ESS System Leader: | Frithiof Jensen |
|  | Tel: (+46 46 888 32 92)  Mobile: (+46 72 179 22 92) |
|  | E-mail: (frithiof.jensen@esss.se) |
|  |  |
| * Area Supervisor(s) | Dennis de Wit |
| *(To be repeated if different areas are involved)* | Tel: (+46 46 888 xxxx)  Mobile: (+46 72 2073683) |
|  | E-mail: ([dennis.dewit@esss.se](mailto:FirstName.LastName@esss.se)) |
|  |  |
| * Electrical Operation Leader | First/Last Name |
|  | Tel: (+46 46 888 xxxx)  Mobile: (+46 72 179 xxxx) |
|  | E-mail: ([FirstName.LastName@esss.se](mailto:FirstName.LastName@esss.se)) |
|  |  |

**And:**

|  |  |
| --- | --- |
| Contractor | Pentair Technical Solutions GmbH |
|  |  |
| * Address: | Langenalber Str. 96 - 100  75334 Straubenhardt, Germany |
| * Represented by: | Manuel Brand |
| Title: | Service Manager |
|  | Tel: +49 171 416 1358 |
|  | E-mail: manuel.brand@pentair.com |
|  |  |
| * Safety representative of the contractor: | Horst Rakel |
|  | Tel: +49 2161 615368 |
|  | E-mail: Horst.Rakel@Pentair.com |
|  |  |
| * Contract/Agreement: | ESS-0087982 |
|  |  |

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# Purpose

This WSCP is a contractually binding document and shall be implemented by the ESS staff, their relevant In-Kind Contribution (IKC) partners and/or contractors.

The main purpose of that document is to identify the list of preparatory and organizational measures required prior to the start-up of the installation activity to be carried out by the contractor, as well as the list of associated hazards and safety control measures to be implemented.

The WSCP shall be subject to adjustments and updates adapting to the on-going ESS accelerator installation activity.

# Introduction

European Directives & Regulations, Swedish national regulations as well as European Spallation Source ERIC Safety rules apply on the entire site of the ESS facility and shall be respected by the contractors and In-Kind Contributors (IKC). For easiness of use, in the current document the term *contractor* shall refer to contractors, IKC or any other ESS collaborating party.

The present WSCP is prepared in accordance with the applicable ESS safety rules for the coordination of Safety aspects and is specific to the contract mentioned at the front page.

# Commitment

The Contractor Representative, signatory of this document, is committed to:

* Enforce the application of the provisions of this document by its personnel; justify in writing that its staff has been trained in all of these provisions;
* Forward this WSCP and all related documents, for application, to all its sub-contractors and any person or entity intervening on his behalf on the ESS site in the context of the contract subject of this document;
* Collaborate in the Safety process within the framework of the implementation of the contract on the ESS site by:
* Informing the ESS System Leader of any changes in operating methods associated with the contract/activity;
* Participating in regular meetings related to the contract/activity;
* Enforcing specific requirements notified through amendments or pre-work visits;
* Reporting risk observations (accidents and/or near misses);
* Contributing to the update of this document as often as necessary.

# Applicable documentation and regulatory framework

The following regulations and documents related to Safety in the context of the contract execution on the ESS site by the contractor shall be followed:

**Swedish regulations**

* [Swedish Work Environment Act (AML), Reference No.: SFS 1977:1160](http://www.government.se/government-policy/labour-law-and-work-environment/19771160-work-environment-act-arbetsmiljolagen/);
* [Swedish Work Environment Regulations (AFS)](https://www.av.se/en/work-environment-work-and-inspections/publications/foreskrifter/);
* [Swedish Posting of Workers Act, Reference No.: SFS 1999:678](http://www.government.se/government-policy/labour-law-and-work-environment/1999678-posting-of-workers-act/);
* [Building and Civil Engineering work (AFS 1999:3)](https://www.av.se/en/work-environment-work-and-inspections/publications/foreskrifter/building-and-civil-engineering-work-afs1999-3eng-provisions/).

**ESS & Skanska regulations and applicable documentation**

* ESS-Skanska Health and Safety Plan [1];
* ESS-Skanska Guidelines for ESS Stakeholder Access [2];
* General conduct and safety rules ESS – Conventional Facilities Worksite [3];
* ESS Rules for Electrical Safety [4];
* Procedure for Authorizing Work in ESS workspaces [5];
* General information for contractors coming on the ESS site [6];
* Installation responsibility matrix [7];
* ESS accident/incident reporting form [8].

# Work Coordination Plan

## General information

General information regarding the activity

|  |  |
| --- | --- |
| **Start date of the activity:** 2018/01/10 | **End date of the activity:** 2018/01/19 |

**Description of the activity (summary):**

Installation of water cooled rack rows in the Accelerator Front-End building, primarily at Level 090.

* Delivery Racks and Equipment to FEB: Unpacking on Lorry, lifting from Lorry, transportation to FEB, Placing acc. to Layout, removing packaging. Performed by shipping company of Pentair
* Installation of Rack rows: adjusting and baying of rack/rows incl. divider and endpanels acc. to provided installation plan and layout, installation of PDUs, installation of aisle containment (no containment in FEB) Performed by sub-contractor Pentair
* Installation of cable trays on top of rack rows. In the responsibility of ESS (requirement for water installation/piping works) Performed by ESS
* Water installation: installation of water pipes from interface to rack rows acc. to provided installation plan and layout on pre-installed cable trays. Performed by sub-contractor Pentair
* Water and Power connection to cooling units: In the responsibility of ESS
* Final acceptance test FAT: Performed by sub-contractor Pentair and ESS

Some of the racks to be installed will be shipped to in-kind partners and manufacturers for internal installations to be performed. These racks will be installed with the equipment inside, into existing rack rows. These racks will heavier than the empty racks and more precision is required by the installers when placing the rack into its final location.

Electrical power connection to the racks made by ESS and internal connections made by the rack installers, for example for the cooling units, will be socket-plug connections with little possibility of interfering with live parts.

The water connections are TBD. Internal water piping will be performed by flexible hoses for service access to the cooling units and rigid pipework for water distribution. The installed pipework will be permanently joined with crimp-type connectors on site or welded, off-site, depending on the manufacturing process.

Some signal cabling for P/ID and data-communications will be installed also. This cabling will be using either site-installed crimp-type connectors or factory made pre-terminated cabling, TDB. In case cables are terminated on-site, heat-shrinking is likely used to secure the connectors and to permanently attach labels and such.

Produce a detailed summary of the information in the tender including:

1. System deliverables (e.g. DTL, RFQ, RF distribution system, etc.) – see [Annex 5](#_Annex_5_–)
2. Equipment list (e.g. lifting equipment, analyzation equipment, etc.) – see Annex 6
3. Installation processes & milestones and deliverable documentation – see [Annex 7](#_Annex_7_–_2)

The detailed list of the racks to be installed by the contractor, Pentair, are available in [ESS-0085695](https://chess.esss.lu.se/enovia/link/ESS-0085695/21308.51166.7424.12829/valid) in the document “Appendix 5.2 Rack space power and heat dissipation requirements\_RevX.xlsx”, where ‘the highest value of X’ represent the latest version.

**Working hours:**

Normal working hours on the ESS site are from 07:00 to 16:00 from Monday to Friday - working days.

**Arrangements for organizing the work outside normal working hours:**   
**Pentair would like to get an authorisation for work outside normal working hours:**

* From 07:00 to 18:00
* And from Monday to Saturday if possible

Note: An authorisation shall be completed and addressed to the Area Supervisor for any work performed outside normal working hours and working days. This notice has to be further approved by the Skanska ESS construction site management.

### Installation/implantation map

The installation/implantation map shall be available (and up-to-date) by the contractor, after the approval of the System Leader.

The installation/implantation map shall include patterns and detailed information for the drilled holes/threaded inserts or other fixations of the system with the floor, with its exact location with respect to the physical plant (walls etc.).

The alignment strategy of the contractor, including the relevant fiducialization procedure of the components (when applicable), shall include the verification of the installation/implantation map.

### Information concerning the contractor

All the information (such as personnel list, operational procedures, provisions for training, etc) concerning the contractor, its sub-contractors can be found in [Annex 4](#_Annex_4_–_1) of this document.

### Sub-contractors

|  |  |  |
| --- | --- | --- |
| Will the contractor sub-contract any activities? | YES | NO |

Table 1 - List and type of sub-contracted work

|  |  |  |
| --- | --- | --- |
| Sub-contractor name | Type of work sub-contracted | Contact person on site/ tel. |
| Spedition Ochs | Transport, Lifting of equipment from truck, placing racks, removing of packaging | tbd |
| Congiv GmbH | Installation of rack rows, equipment and containments, | tbd |
| Technotrans AG | Piping works/water installation, testing, pressure testing of pipes, function test cooling devices, FAT | tbd |

\* Personnel list can be found in [Annex 4](#_Annex_4_–_3).

Note: more details regarding the duration of the activities sub-contracted can be found in the installation schedule from the contractor.

## Preparatory measures

### Pre-work visits

A pre-work visit of workplaces, facilities and equipment made available to the contractors and their sub-contractors is carried out prior to the execution of the work in the presence of all the intervening stakeholders (see [Annex 8](#_Annex_8_–)). The main purpose of this visit is to validate on-site the safety measures as defined in the WSCP.

Minimum participation: ESS System Leader and Contractor Representative, Area Supervisor, Work Leader(s)/Supervisor(s) (if any) and Safety Representative(s) (ESS & SEC).

### Declaration of works and services

Certain types of works and services might be subject to a request for authorization before the start-up of the intervention. The work and services can be realized only after obtaining all the necessary signatures. It is important to note that in all sectors (such as the Accelerator Tunnel (AT), Klystron Gallery (KG), Target area, etc.) the access is subject to specific access procedures and regulations.

## Organizational measures during the installation activity

### General organizational measures

Table 2 - General organizational measures

|  |  | Action to be taken by | Remarks |
| --- | --- | --- | --- |
| **Delivery to site** | | | |
| Delivery of system/equipment to site | Yes  No | AS  SL  CR  Other | Any delivery to site shall be coordinated with the transport & logistics group ([logistics@esss.se](mailto:logistics@esss.se)) |
| Workplace | | | |
| Identification of the area of intervention | Yes  No | AS  SL  CR  Other | See site map ([Annex 1](#_Annex_1_-)) |
| Physical delimitation of the area of intervention | Yes  No | AS  SL  CR  Other |  |
| Access roads to the area of intervention | Yes  No | AS  SL  CR  Other | See site map ([Annex 1](#_Annex_1_-)) |
| Risk associated with parallel works | | | |
| Identification of these areas. | Yes  No | AS  SL  CR  Other | See AHA ([Annex 2](#_Annex_2_–_1)) |
| Physical delimitation of these areas | Yes  No | AS  SL  CR  Other | See AHA ([Annex 2](#_Annex_2_–_1)) |
| Storage (lay-down) areas | | | |
| Identification of those locations | Yes  No | AS  SL  CR  Other | See site map ([Annex 1](#_Annex_1_-)) |
| Marking of the storage areas | Yes  No | AS  SL  CR  Other |  |
| Waste management | | | |
| Needs for dumpsters | Yes  No | AS  SL  CR  Other | To be coordinated with Skanska during the waste management training |
| Equipment or machines used | | | |
| Equipment/machines used by the contractor | Yes  No | AS  SL  CR  Other |  |
| Other | Yes  No | AS  SL  CR  Other |  |
| REMINDER  Any modification of general organization shall be reported immediately to the ESS System Leader and Area Supervisor.  AS: Area Supervisor  SL: ESS System Leader  CR: Contractor Representative | | | |

### Participation of ESS to the work

Table 3 - Participation/provisions of ESS to the work

|  |  | Action to be taken by | Remarks |
| --- | --- | --- | --- |
| Provision of services by ESS | | | |
| Electricity | Yes  No | AS  SL  CR  Other | 400 V 3p, 32 A and 230 V AC, 13A for various tools, |
| Water | Yes  No | AS  SL  CR  Other |  |
| Lighting | Yes  No | AS  SL  CR  Other |  |
| Drainage | Yes  No | AS  SL  CR  Other |  |
| Compressed air | Yes  No | AS  SL  CR  Other |  |
| Changing rooms, toilets and shower | Yes  No | AS  SL  CR  Other | To be coordinated with Skanska |
| **Provision of staff by ESS** | | | |
| Staff provided by ESS | Yes  No | AS  SL  CR  Other | Specify type of work and qualifications |
| **Provision of equipment /machines by ESS** | | | |
| Equipment/machines provided by ESS | Yes  No | AS  SL  CR  Other | Specify in equipment list (Annex 7) |
| Other | Yes  No | AS  SL  CR  Other |  |
| **REMINDER**  Any modification of the participation of ESS to the work shall be validated by written agreement between the ESS System Leader and the Contractor Representative.  AS: Area Supervisor  SL: ESS System Leader  CR: Contractor Representative | | | |
|  | | | |

### Preliminary measures taken/to be taken by ESS

Table 4 - Preliminary measures taken/to be taken by ESS

|  |  | Action to be taken by | Remarks |
| --- | --- | --- | --- |
| Worksite safety measures  Lock-out/tag-out of electricity, water, gas, cryogenic fluids, etc. | Yes  No | AS  SL  CR  Other | Specify equipment/installation to be de-energized |
| Lock-out/tag-out of mechanical installations/equipment | Yes  No | AS  SL CR  Other | Specify equipment/installation to be de-energized |
| Preparatory work  Extraction of equipment, area delimitations, signage, etc. | Yes  No | AS  SL  CR  Other | See site map ([Annex 1](#_Annex_1_-)) |
| Other | Yes  No | AS  SL  CR  Other |  |
| Please note that all lock-  AS: Area Supervisor  SL: ESS System Leader  CR: Contractor Representative out/tag-out activities shall be performed in accordance with the ESS rule for lock-out/tag-out [9]. | | | |
|  | | | |

# Safety Coordination Plan

## Assessment of occupational hazards and control measures

The risk assessment shall identify the work situations that are dangerous and/or likely to cause interference between activities, facilities and equipment.

### Hazards related to the work environment, facilities and activities of ESS (Area Hazard Analysis)

Hazards inherent to the work environment, facilities and activities of ESS as well as compensatory measures have to be identified and evaluated prior to the start-up of the work activity by the Area Supervisor. This Area Hazard Analysis (AHA) [5] shall be included in [Annex 2](#_Annex_2_–) of the present document.

### Hazards related to the interference of activities (parallel works)

Table 5 - Hazards related to the interference of activities

| Interference type |  | Description of the mitigation measure | Action to be taken by |
| --- | --- | --- | --- |
| Overlapping works | Yes  No |  | AS  SL  CR  Other |
| Adjacent works | Yes  No | Piping, potential bonding and cable tray installation in parallel. | AS  SL  CR  Other |
| Transport/handling | Yes  No | Make sure contractor knows Skanska and ESS logistic rules for transportation, in particular rules for safe transportation | AS  SL  CR  Other |
| Sharing of specific access/passages | Yes  No | Contractor to coordinate work or transport on daily basis, and when necessary. | AS  SL  CR  Other |
| Other types of interference | Yes  No | Welding of pipes need shielding for UV light and fumes. Concrete drilling for fasteners may be ongoing. | AS  SL  CR  Other |
| AS: Area Supervisor  SL: ESS System Leader  CR: Contractor Representative | | | |

Note: more information regarding the hazards related to parallel works can be found in the minutes of the weekly coordination meetings on site.

If cases of parallel works other than the ones mentioned in the AHA ([Annex 2](#_Annex_2_–)) are revealed during the works, the contractor shall:

* Temporarily stop the activity,
* Immediately report the unplanned co-activity to the Area Supervisor.

The ESS System Leader shall, in collaboration with the contractor and the other intervening entities performing parallel works, decide on additional measures to be implemented.

Each intervening entity shall bear the protections or the measures to be put in place to minimize the risks generated by its activities with respect to other intervening entities.

### Hazards related to the work activities of the contractor

#### Job Hazard Analysis (JHA) provided by the contractor

Hazards inherent to the contractor’s work activities as well as compensatory measures are to be identified and evaluated prior to the start-up of the work by the ESS System Leader and the Contractor Representative. This Job Hazard Analysis (JHA) [5] shall be included in [Annex 3](#_Annex_3_–) of the present document.

#### Specific supplements and ESS requirements following the analysis of the activity of the contractor

To be completed or specified that there are no additional requirements.

### Control documents to be submitted to the Area Supervisor

Control documents to be provided to the Area Supervisor prior to the start-up of the work are listed below:

|  |  |  |
| --- | --- | --- |
| YES | NO |  |
|  |  | Lock-out/tag-out permit: electrical, mechanical, fluids, etc. |
|  |  | Fire/hot work permit (including alarm inhibition) |
|  |  | Confined space work procedure |
|  |  | Work authorization for specific areas |
|  |  | Authorization for the use of lifting equipment |
|  |  | Other: |

## Arrangements for information and training of personnel

### Safety awareness/training related to the activities on the ESS site

The contractor must continuously ensure that its personnel working on the ESS site has followed appropriate Safety training and awareness as well as associated refresher courses.

Regardless of its activity, and before working on the ESS site, each member of the contractor personnel must follow the awareness sessions mentioned below:

ESS site Safety induction (contact [site.reception@esss.se](mailto:site.reception@esss.se) to book a training session)

ESS site waste management (contact [site.reception@esss.se](mailto:site.reception@esss.se) to book a training session)

In addition, the contractor personnel\* must follow specific awareness sessions depending on the areas to be accessed and/or the type of activity to be performed:

Radioprotection

Electrical Safety - Awareness

Cryogenic Safety – Awareness

Interventions in confined spaces

Work at height

Safety harness

First-aid training

Lifting equipment

Hot work

Other:

\* These provisions also apply to sub-contractors as well as to any person intervening on a temporary or ad hoc basis.

Note: all applicable control documents and training certificates referred in 6.1.4 and 6.2.1 shall be attached to the present WSCP.

### First aid training

It is requested by ESS that the minimum number of first-aiders at the worksite corresponds to one per working team. In addition, ESS recommends that all contractors performing electrical works on site, follow a First Aid Training (AED) including Electrical Injuries.

### Provisions for training and information of contractor personnel

See [Annex 4](#_Annex_4_–).

## Site map (worksite/area layout)

A site map prepared by the Area Supervisor shall be provided to the contractor prior to the start-up of the work. The site map shall contain at least the following information (see [Annex 1](#_Annex_1_-_2)):

* perimeter of the activity to be carried out;
* lay-down areas for equipment and materials;
* location of the emergency exits and assembly points;
* location of the fire extinguishers, first-aid kits, etc;
* location of entrances/exits for personnel and equipment;
* location of utilities (e.g. waste container, toilets, etc.);
* access routes for personnel and equipment.

An editable version of the digital document can be found at [10].

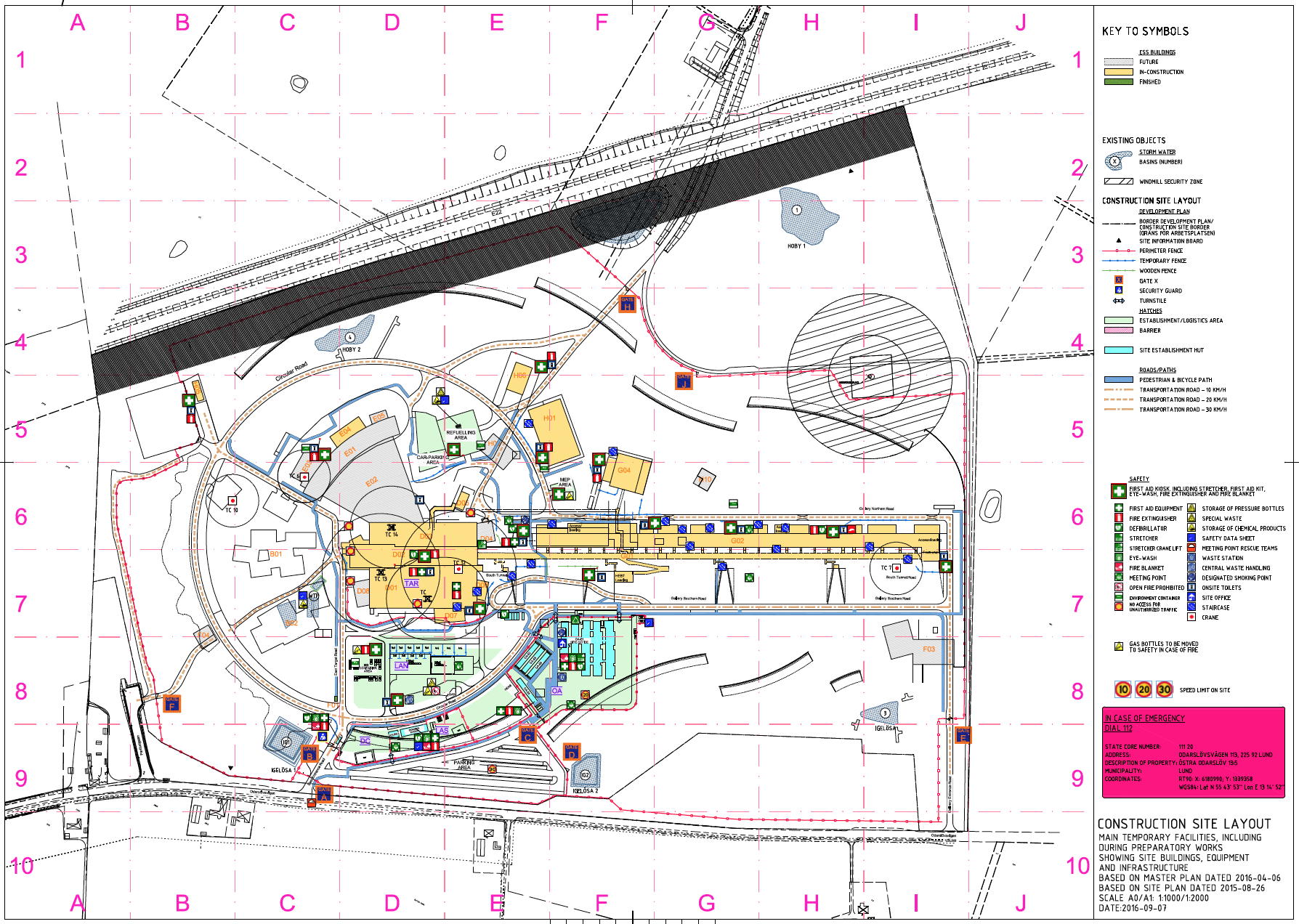
## Reporting in case of an accident/incident

Any accident that caused bodily injury with or without work interruption on the ESS site, including when traveling on the ESS site, shall be immediately reported to the ESS System Leader. This reporting shall be made in written (see [Annex 9](#_Annex_9_–) and [Annex 10](#_Annex_10_–)).

The document shall be completed by the contractor and addressed to the national authority and the insurance company of the victim.

The ESS System Leader shall notify the ESS ES&H Division ([bertil.winer@esss.se](mailto:bertil.winer@esss.se)) with an internal accident report including relevant documentation provided by the contractor as attachment.

# Annex 1 - Site Map (worksite/area layout/drawing)



# Annex 2 – Area Hazard Analysis (AHA)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Work Area:** Accelerator tunnel G01 and FEB level 90 | | | | |
| **Brief description of activities to be authorized for this work area:**  provide a detailed description of the installation activities to be performed | | | | |
| **Approvers** | **Name** | **Date** | **Signature** | **Phone No.** |
| **Area Supervisor** | First/Last Name | yyyy/mm/dd |  | Phone No. |
| **Line Manager** | First/Last Name | yyyy/mm/dd |  | Phone No. |
| **ES&H Division or designated Safety Committee Rep.** | First/Last Name | yyyy/mm/dd |  | Phone No. |
| **Division Head** | First/Last Name | yyyy/mm/dd |  | Phone No. |

**Hazard Identification**

| **Potential Hazard** | **Present in Area?** | **Present in adjacent work area?** | **HAZARD description** |
| --- | --- | --- | --- |
| **Biological Safety** | | | |
| Biological agents |  |  |  |
| Legionella |  |  |  |
| **Chemical Safety** | | | |
| Asbestos |  |  |  |
| CMR |  |  |  |
| Corrosive |  |  |  |
| Dangerous for the environment |  |  |  |
| Explosive |  |  |  |
| Flammable |  |  |  |
| Harmful |  |  |  |
| Irritant | Yes |  | Cleaning fluids, Glues and Resins (if used). Concrete dust may be produced by drilling. |
| Oxidizing |  |  |  |
| Toxic |  |  |  |
| **Cryogenic Safety and Oxygen Deficiency Hazards (ESS-0038692)** [11] | | | |
| Cryogenic fluid |  |  |  |
| Inert gases |  |  |  |
| **Electrical and Electromagnetic Safety (ESS-0012721)** [4] | | | |
| Electricity | Yes |  | Normal electrical sockets and power tools. Low Voltage Switchgear, Distribution Panels, and electrical machinery. |
| Magnetic field |  |  |  |
| Static electricity |  |  |  |
| **Ionizing radiation** | | | |
| Open sources |  |  |  |
| Closed sources |  |  |  |
| Activated material |  |  |  |
| Radioactive waste |  |  |  |
| Particle beam |  |  |  |
| **Non ionizing radiation** | | | |
| Laser (class to be specified) (ESS-0044704) [12] |  |  |  |
| Microwaves (300 MHz-30 GHz) |  |  |  |
| Radio frequency (1MHz-300MHz) |  |  |  |
| UV Light | Yes |  | Welding in the area, some resins and glues are UV cured. |

Please mark with a cross any potential hazards that could be present in the work area:

| **Potential Hazard** | **Present in Area?** | **Present in adjacent work area?** | **HAZARD description** |
| --- | --- | --- | --- |
| **Mechanical Safety** |  |  |  |
| Lifting equipment |  | X | Unloading procedure of the trucks |
| Machinery |  |  |  |
| Mechanical energy (moving parts) |  |  |  |
| Mechanical properties (sharp, rough, slippery) |  |  |  |
| Pressure |  |  |  |
| Surface temperature |  |  |  |
| Vacuum |  |  |  |
| **Workplace** |  |  |  |
| Confined spaces |  |  |  |
| Dust | X |  |  |
| Fall from height | X |  | Working on steps and ladders |
| Falling objects | X |  | Parts or tools could fall from height |
| Fall on the same level |  |  |  |
| Lone working |  |  |  |
| Obstruction in passageways |  |  |  |
| Traffic |  |  |  |
| Working at height | X |  | Using steps and ladders |
| **Structural Safety** |  |  |  |
| Structures (inadequate design or condition) |  |  |  |
| **Ergonomics** |  |  |  |
| Air quality |  |  |  |
| Lighting |  |  |  |
| Manual handling |  |  |  |
| Mental overload (ESS-0048472) [13] |  |  |  |
| Moisture |  |  |  |
| Noise | X |  | Using electrical tools |
| Repetitive activity |  |  |  |
| Temperature |  |  |  |
| VDU work (Visual Display Unit) |  |  |  |
| Vibrations |  |  |  |
| **Worksite** |  |  |  |
| Co-activity |  |  |  |
| Hot work (welding, flame cutting, brazing, sparks, etc.) | X |  | No welding activities. Sparks could be produced by using band saw |

|  |  |  |  |
| --- | --- | --- | --- |
| **Potential Hazard** | **Present in Area?** | **Present in adjacent work area?** | **HAZARD description** |
| **Environment** |  |  |  |
| Discharge of effluents to sewage |  |  |  |
| Emission of noise harmful for the environment |  |  |  |
| Emission of substances into the atmosphere |  |  |  |
| Generation of vibrations harmful for the environment |  |  |  |
| Historical site pollution (chemical) |  |  |  |
| Odors |  |  |  |
| Soil activation (radioactive) |  |  |  |
| Use/storage of potentially polluting substances (gases, liquids, solids) |  |  |  |
| Waste generation | Yes |  | Packaging materials, Cable scrap, Cable drums, Transport pallets. |
| **Others** |  |  |  |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PERSONAL PROTECTIVE EQUIPMENT (PPE) TO CONSIDER** | | | | | | | | | | | | | | | | | |
| **A** | http://www.hse.gov.uk/workplacetransport/images/mandatory-gloves-2.gif  Safety gloves (EN 388, EN 420) | **B** | http://www.hse.gov.uk/workplacetransport/images/mandatory-helmet-2.gif  Safety helmet  (EN 812, EN 397, EN 14052 or EN 13087) | **C** | http://www.hse.gov.uk/workplacetransport/images/mandatory-boots-2.gif  Safety shoes (EN 345, EN 346 or EN 347) | **D** | http://www.hse.gov.uk/workplacetransport/images/mandatory-ear-2.gif  Ear protection  (EN 352) | **E** | http://www.hse.gov.uk/workplacetransport/images/mandatory-face-2.gif  Face protection  (EN 166) | **F** | **http://www.hse.gov.uk/workplacetransport/images/mandatory-eye-2.gif**  Eye protection (EN 166) | **G** | High visibility clothing  (EN 471 class 2)Macintosh HD:Users:duyphan:Downloads:download.png | **H** | http://www.modernsignsdigital.co.uk/image/cache/data/Masks%20Mandatory/Respiratory-Protection-Symbol-500x500.jpg  Respiratory protection  (EN 149) | **I** | Other, please specify: |
| Note: Job specific PPE and training, along with licenses, permits, procedures or any other control or mitigation measures required to deal with specific hazards are addressed in the Job Hazards Analysis for specific work activities. | | | | | | | | | | | | | | | | | |

# 

# Annex 3 – Job Hazard Analysis (JHA)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Job:** Piping and cable tray installation in accelerator tunnel and the Klystron Gallery | | | | | |
| **Number of people performing the job:** 8-10 (+2 occasional installation leader from contractor) | | | | | |
| **Start date:** | | | **End date:** | | |
| **Location/Work Area:** Klystron Gallery and FEB (level 90, Level 100) | | | | | |
| **Approvers** | **Name** | **Date** | | **Signature** | **Phone No.** |
| Area Supervisor:  System Leader: | Dennis de Wit | yyyy/mm/dd | |  | Phone No. |
| If work is considered to be hazardous or new  ES&H Div or designated Safety Committee Rep:  Division Head: | Duy Phan | yyyy/mm/dd | |  | Phone No. |
| Note: The JHA shall be regularly reviewed and updated if necessary as indicated in [5]. A copy of this JHA shall be kept in the location at the premises where the job shall be performed. | | | | | |

| **Work Tasks/Steps** Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection. | **Associated Hazards**  Identify activity hazards for each step. | **Controls, Preventive Measures, and Actions** Specify compensating measure for each hazard | **Time estimation**  Specify the time estimated to perform each task/step of the work activity |
| --- | --- | --- | --- |
| Installation of cables | Falling from height | Make sure correct scaffolding is used  Only allow experienced welders to work on site  Hot works permit |  |
| Dressing of cables | Use of knives, cable cutters, crimp tools, hot-air blower for heat-shrink tubing. | Make sure that only competent people operate the tools  PPE |  |
| Unpacking of Racks and components | Use of knives, clutter | Make sure that only competent people operate the tools  PPE |  |
| Exposure to chemicals (cleansing agents, glue, resins) | Mainly eye and skin damage | Use designated PPE, correct storage, such as plastic crates. Make sure all users have read and understood product data sheets |  |
| Moving machines close to working area | Collision with person or equipment | Clearly mark work areas, coordinate and plan transportation,  Use reflective clothing (EN 471 class 2) |  |
| Work with machines | Risk of cutting/pinching/crushing/burning | Use gloves and other PPE  Make sure staff are trained in the proper usage of power tools |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Work with machines above shoulder level | Ergonomic hazards | Use modern tools  Limit time of usage |  |
| Noise | Hearing damage | Use ear protection  Coordination of noisy work |  |
| Dust from drilling | Lung damage | Use vacuum cleaners with filters  Coordinate drilling |  |
| Fumes from heat-shrinking materials | Irritation of eyes, airways | Use local ventilation to disperse fumes |  |
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# Annex 4 – Complementary information

**Contractor**: Pentair Technical Solutions GmbH / Subcontractor Congiv GmbH /Subcontractor Technotrans AG

**Provisions for the information and training of personnel**

Safety training for ESS site will be provided by ESS acc. to WSCP. Apart from that, all technicians are trained and certified according to the German training regulations and registered in the trade register.

**Personnel list of the contractor**

|  |  |  |  |
| --- | --- | --- | --- |
| First/Last Name | Role1 | Certification/ Authorization | First aider  YES/NO2 |
| Manuel Brand | Service  Manager Pentair | Service Manager | Yes |
| **Sub-contractor Congiv** | | | |
| Christoph Haid | Installation team leader | Mech. Engineer with additional electrical qualification | Yes |
| Martin Roth | Installation team | Mech. Engineer with additional electrical qualification | No |
| Kay Uhlig | Installation team leader | Mech. Engineer with additional electrical qualification | Yes |
| Lars Uhlig | Installation team | Mech. Engineer with additional electrical qualification | No |
| Hans-Otto Brünninghaus | Installation team leader | Mech. Engineer with additional electrical qualification | Yes |
| Andreas Jakisch | Installation team | Mech. Engineer with additional electrical qualification | Yes |
| **Sub-contractor technotrans** | | | |
| Ralph Hummitzsch | Installation team leader | Mech. Engineer with additional electrical qualification | NO |
| Ilias Kapatsoulias | Installation team member | Mech. Engineer with additional electrical qualification | NO |
| Julius Heuser | Installation team member | Electrical Engineer | NO |
| **Shipping company Spedition Ochs** | | | |
| Harald Ochs | Boss of shipping comp. | Truck driver, mover |  |
| Robin Gutekunst | driver | Truck driver, mover |  |
| Jan Landeck | driver | Truck driver, mover |  |
| Dietmar Klenk | driver | Truck driver, mover |  |
| Markus Heilig | driver | Truck driver, mover |  |
| Ulrich Bosch | driver | Truck driver, mover |  |
| Ronald Mertens | driver | Truck driver, mover |  |
| Marco Maier | driver | Truck driver, mover |  |
| Gerd Engelhardt | driver | Truck driver, mover |  |
| 1: It is requested by ESS that the minimum number of English speakers corresponds to one per working team.  2: It is requested by ESS that the minimum number of first-aiders at the worksite corresponds to one per working team.  CR: Contractor Representative | | | |

# Annex 5 – System Deliverables (e.g. DTL, RFQ, RF distribution system, etc.)

| **Item name** | **Description** | **Quantity** |
| --- | --- | --- |
| TS2 | Rack rows with internal cooling systems. | 26 racks, in 2 rows. |
| DTL/SPK | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 60 racks, 14 side coolers |
| SPK | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| FEB | Rack rows with internal cooling systems. | 54 racks, 5 rows, 14 side cooler |
| SPK/MBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| MBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| MBL/HBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| HBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| HBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| HBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| HBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| HBL | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| HEBT | Rack aisle containment with internal cooling system, sliding doors. | 2 aisles, 72 racks, 16 side coolers |
| A2T | Rack rows with internal cooling systems. | 1 row, 9 racks, 2 side coolers |
|  |  |  |
| SL: ESS System Leader  CR: Contractor Representative | | |

**You find a detailed description of deliveries and installation procedure in attachment “Project Plan ESS Gallery\_Rev.1.3.pdf”. It is too complex to monitor it here.**

# 

# Annex 6 – Equipment List (e.g. lifting equipment, analyzation equipment, etc.)

| **Item name** | **Description** | **Quantity** | **Unit cost** |
| --- | --- | --- | --- |
| Toolbox with tools | Tools for mechanical work | 2 | 400,-€ |
| Screwdrivers | To screw screws | 3 | 50,-€ |
| scale | To measure sth. | 2 | 3,-€ |
| Laser distance measurement system | Distance measuring | 2 | 30,-€ |
| step | To step up | 2 | 15,-€ |
| Roller | To move racks | 3 | 35,-€ |
| Cordless screw drivers | To screw or drill sth. | 4 | 240,-€ |
| Band saw machine | To cut alu profiles | 1 | 400,-€ |
| Cable reel | Getting power for electric machines | 1 | 75,-€ |
| Jig saw | Cutting truss | 1 | 240,-€ |
| Rock drill | To drill in concrete | 1 | 440,-€ |
| Angle grinder | To grind sth. | 1 | 270,-€ |
| Hoover | To clean sth. | 1 | 330,-€ |
| Bar clamps | To fix door handles | 2 | 50,-€ |
| Pitch bar | Moving heavy things | 2 | 30,-€ |
| Cleaning utilities | Cleaning | 1 | 40,-€ |
| Crimping Tool  22 - 76 mm | Crimping tool for Sanha piping components | 1 x |  |
| tubing cutter 3'' mechanical and electrical | To cut the piping | 2x |  |
| Grinder  mechanical and electrical | Fettling of the components | 2x |  |
| [battery-powered](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.dict.cc_englisch-2Ddeutsch_battery-2Dpowered.html&d=DwMFAw&c=0s2QeJVZoDkH0rUub6UaoA&r=ziC4BodU-SyjAcfLdqPKbsOf9MIbWVC8QhuaovepV0I&m=nI7nWTEKZ-KNF0qGdpx62h12y9XYQGksty0mZ6FiXPM&s=7owzXpeyCklc4k1m0mH3tlUl6ihYVdS_k8qjotTEZnI&e=) [screwdriver](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.dict.cc_englisch-2Ddeutsch_screwdriver.html&d=DwMFAw&c=0s2QeJVZoDkH0rUub6UaoA&r=ziC4BodU-SyjAcfLdqPKbsOf9MIbWVC8QhuaovepV0I&m=nI7nWTEKZ-KNF0qGdpx62h12y9XYQGksty0mZ6FiXPM&s=FYNDDDwe7Wb7cEK8CJYmpjy9QmApl4_EABc6m1aIUxY&e=) | Fitting of components | 2x |  |
| working bench | Workplace to prefabricate components | 1x |  |
| cable spool | Cable extension | 1x |  |
| [percussion](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.dict.cc_englisch-2Ddeutsch_percussion.html&d=DwMFAw&c=0s2QeJVZoDkH0rUub6UaoA&r=ziC4BodU-SyjAcfLdqPKbsOf9MIbWVC8QhuaovepV0I&m=nI7nWTEKZ-KNF0qGdpx62h12y9XYQGksty0mZ6FiXPM&s=0S_bkZLef6SNF7pQdtppJ6r4uO2WAmQ7krmOylSIGpA&e=) [drilling](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.dict.cc_englisch-2Ddeutsch_drilling.html&d=DwMFAw&c=0s2QeJVZoDkH0rUub6UaoA&r=ziC4BodU-SyjAcfLdqPKbsOf9MIbWVC8QhuaovepV0I&m=nI7nWTEKZ-KNF0qGdpx62h12y9XYQGksty0mZ6FiXPM&s=0RoJ0NoMQj9hwbyAjQR29JqP3Ra0v6VjWXWlTT6Znjk&e=) [machine](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.dict.cc_englisch-2Ddeutsch_machine.html&d=DwMFAw&c=0s2QeJVZoDkH0rUub6UaoA&r=ziC4BodU-SyjAcfLdqPKbsOf9MIbWVC8QhuaovepV0I&m=nI7nWTEKZ-KNF0qGdpx62h12y9XYQGksty0mZ6FiXPM&s=sGi6JSi56AeUTGbY45fr4zm2KMC7Qt7xs0OkkWr91TY&e=) | To drill holes in concrete e.g. | 1x |  |
| ladder | To climb | 1x |  |
| Tool case with handtools | Mech. and electoral hand tools | 2x |  |
| SL: ESS System Leader  CR: Contractor Representative | | | |

| **Document required for installation and service/maintenance** | **Yes** | **No** |
| --- | --- | --- |
| Document for testing, reporting and acceptance, FAT (attachment “FAT\_ESS.pdf”) |  |  |
| to be filled-in by the SL and CR |  |  |
| to be filled-in by the SL and CR |  |  |
| to be filled-in by the SL and CR |  |  |
| SL: ESS System Leader  CR: Contractor Representative | | |

# Annex 7 – Installation Processes

**You find a detailed description of deliveries and installation procedure in attachment “Project Plan ESS Gallery\_Rev.1.3.pdf”. This includes the schedule.**

**It is the same procedure for all 14 Steps. You find the schedule in the attachment.**

| **Installation process** | **Description** | **Start date** | **End date** |
| --- | --- | --- | --- |
| Delivery, Unpacking and transportation within the installation area | Shipping of all goods to ESS site, Unloading, unpacking and transportation of Racks and material to installation area. Positioning of Racks acc. To Layout. Performed by forwarder Sped. Ochs. | See attachment | See attachment |
| Installation, mounting and fixing | Installation of Racks & Interior, Containment, Pipes and water installation acc. To layout and time schedule ESS. | See attachment | See attachment |
| Installation of cable trays onto rack rows (only FEB) | Installation of cable trays onto rack rows for water pipes and cables | See attachment | See attachment |
| Piping/ Water installation | Installation of Pipes from room interface to side coolers. | See attachment | See attachment |
| Water and Power connection | Water and Power connect. In the Reasonability of ESS. Acc. Time schedule | See attachment | See attachment |
| Testing | Testing acc. To Final Acceptance Test and time schedule. (Pentair Documents)  Responsible: CR and ESS | See attachment | See attachment |
| Removal of material and equipment from the installation area | Pentair workers will remove their material and equipment after finishing work. |  |  |
| SL: ESS System Leader  CR: Contractor Representative | | | |

# Annex 8 – Minutes of the pre-work visit

| **Activity:** indicate main activity of the contract | **Date:** yyyy/mm/dd |
| --- | --- |
| **Participants**:  ESS System Leader: First/Last Name  Contractor Representative: First/Last Name  Area Supervisor: First/Last Name  Safety representative(s): First/Last Name, First/Last Name, First/Last Name | |
| **Main findings:**  provide description of main findings | |
| **Mitigation actions:**  provide description of mitigation actions to be taken | |

# Annex 9 – Instructions in case of a serious accident/injury

**IN CASE OF SERIOUS ACCIDENT/INJURY**

1. CHECK FOR ANY DANGER, CASUALTY AND IF POSSIBLE MAKE THE SITUATION SAFE
2. CALL 112 AND PROVIDE THE FOLLOWING INFORMATION:
   1. Nature of the accident/injury
   2. Location of the accident/injury
   3. Number and state of the injured people
   4. Any kind of information that could be of use for the rescue team
3. PERFORM FIRST AID/CPR
4. REPORT IMMEDIATELY TO THE **ESS SYSTEM LEADER** (SPECIFY NAME AND PHONE NUMBER).
5. REPORT IMMEDIATELY TO THE **AREA SUPERVISOR** (SPECIFY NAME AND PHONE NUMBER).
6. REPORT IMMEDIATELY TO THE **CONTRACTOR REPRESENTATIVE** (SPECIFY NAME AND PHONE NUMBER).

ADDRESS TO BE COMMUNICATED TO THE RESCUE TEAM:

**ODARSLÖVSVÄGEN 113, 22592 LUND**

# Annex 10 – Accident/incident reporting form

| ACCIDENT/INCIDENT REPORTING FORM | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Type of event:** | Injury | | Near miss | | Environmental incident | | Other, please specify: | |
| **Name of the victim:** First/Last Name | | | | | **Date of the event:** yyyy/mm/dd | | | **Time of the event:** hh/mm |
| **Location of the event:** specify location of the event (e.g. building) | | | | | | **Precise location:** specify precise location of the event (e.g. room, area) | | |
| **Status of the victim:** | | ESS employee | | Contractor (IK-partner, company) | | | Other, please specify: | |
| **Circumstances and details of the event**:  Provide circumstances and description of the event | | | | | | | | |
| **Immediate actions to be taken:**  Provide the list of immediate actions and control measures taken after the event | | | | | | | | |
| **Any other comments:**  Provide any additiona relevant information | | | | | | | | |
| **Distribution list:**  ESS contact person: First/Last Name – Email address  Area supervisor: First/Last Name – Email address  ESS line manager: First/Last Name – Email address  Divisional Safety Representative: Duy Phan – [duy.phan@esss.se](mailto:duy.phan@esss.se)  ESS Safety Representative: Bertil Wíner – [bertil.winer@esss.se](mailto:bertil.winer@esss.se)  Other: First/Last Name – Email address | | | | | | | | |

# References

|  |  |
| --- | --- |
| [1] | «Health and Safety Plan,» ESS-0020522. |
| [2] | «Guidelines for ESS Stakeholder Access,» ESS-0062090. |
| [3] | «General conduct and safety rules - ESS Conventional Facilities Worksite,» ESS-0063375. |
| [4] | «ESS Rules for Electrical Safety,» ESS-0012721. |
| [5] | «Procedure for authorizing work in ESS workspaces,» ESS-0064035. |
| [6] | «General information for contractors coming on the ESS site,» ESS-0093892. |
| [7] | «Installation responsbility matrix,» ESS-0093460. |
| [8] | «ESS accident/incident reporting form,» ESS-0095940. |
| [9] | «ESS rule for lock-out/tag-out (LOTO),» ESS-0059903. |
| [10] | «ESS construction site layout,» ESS-0093979. |
| [11] | «ESS Guideline for Oxygen Deficiency Hazard (ODH),» ESS-0038692. |
| [12] | «ESS Procedure for Laser Safety,» ESS-0044704. |
| [13] | «ESS Guideline for countering stress,» ESS-0048472. |

# Document Revision history

| Revision | Reason for and description of change | Authors | Date |
| --- | --- | --- | --- |
| 1 | First issue | First/Last Name | yyyy/mm/dd |
|  |  |  |  |
|  |  |  |  |

**Attachments Pentair:**

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1. ESS Document Management System (<https://chess.esss.lu.se/>). [↑](#footnote-ref-1)