Joint-stock company

Latvenergo

Riga HPP
ABRIDGED CIVIL PROTECTION PLAN

Dole island – 2019

Saturs

Introduction

JSC Latvenergo Riga HPP Civil protection plan has been developed based on Sections 14 and 18 of the Civil Protection and Disaster Management Law, Section III of the Cabinet Regulation No.563 "Procedures for Identifying and Determining Objects of Increased Danger, as well as for the Planning and Implementation of Civil Protection and Disaster Management" adopted on September 19, 2017 and Section IV of the Cabinet Regulation No.658 "Regulations regarding Civil protection plan structure and information to be included" adopted on November 7, 2017, as well as "Latvenergo Group Procedure for Emergency situations and Crisis Management".

JSC Latvenergo Riga HPP Civil protection plan has been agreed on October 4, 2019 and approved on October 14, 2019 by the State Fire and Rescue Service Riga Region Department in accordance to the requirements stated in the Clause 4, Section 14 of the Civil Protection and Disaster Management Law.

Due to the fact that the plan contains confidential information the reduced version of the Riga HPP Civil protection plan has been developed in accordance to the Clause 59 of the Cabinet Regulation No.131 Industrial Accident Risk Assesment Procedures and Risk Reduction Measures adopted on March 1, 2016.

Abbreviations used

AB	Upstream
ANS	Automated surveillance system
AST	AS „*Augstsprieguma tīkls*" (JSC Transmission system operator)
ATZ	Anonymous phone call
AUL	Maximum water level in reservoir (18,95 m amsl) (MWL)
BV	Hazardous substances
CA	Civil protection
CAK	Civil protection commission
CSNg	Road traffic incident
DD	Dispatch department
DĢI	Diesel generator
DVKC	Safety management and control center of Safety department
ESI	Oil pressure system (OPU)
GVP	Control room
HA	Hydrounit
HES	Hydr Power Plant (HPP)
HTB	Hydrotechnical structures
HTBD	Hydrotechnical structure department
IAL	Personal protective equipment
IMP	Probable Maximum Flood
IRD	Equipment maintenance department
ITT	Information technology and telecommunication department
KK	Left bank
LAN	Local area network
LAS-2000,5	Latvian standard altitude system
LB	Downstream
LK	Right bank
LVĢMC	Latvian environment geology and meteorology center
NĪAF	Property management department
NP	Oil products
NUL	Normal water level in reservoir (18,15 m amsl) (NWL)
NMPD	State emergency medical service
PK	Level mark (on dam)
PSO	Transmission system operator (*AS „Augstsprieguma tīkls")*
RAAD	Relay protection and automation department
RHPP	Riga hydro power plant
RID	Department of electrical and mechanical equipment
RP	Radioactive pollution
RVP	Regional Environmental Service
SBP	Explosive objects
SD	Plant dispatcher
TN	Transformer
UH	Firefighting hydrant
UPS	Uninterruptible power supply
ŪPA	Spillway dam
vjl.	Above sea level
VDAF	Occupational Health & Safety and Environmental Protection department
VUGD	State Fire and Rescue Service

1. Details of the Object of increased danger, location and land cadastral designation

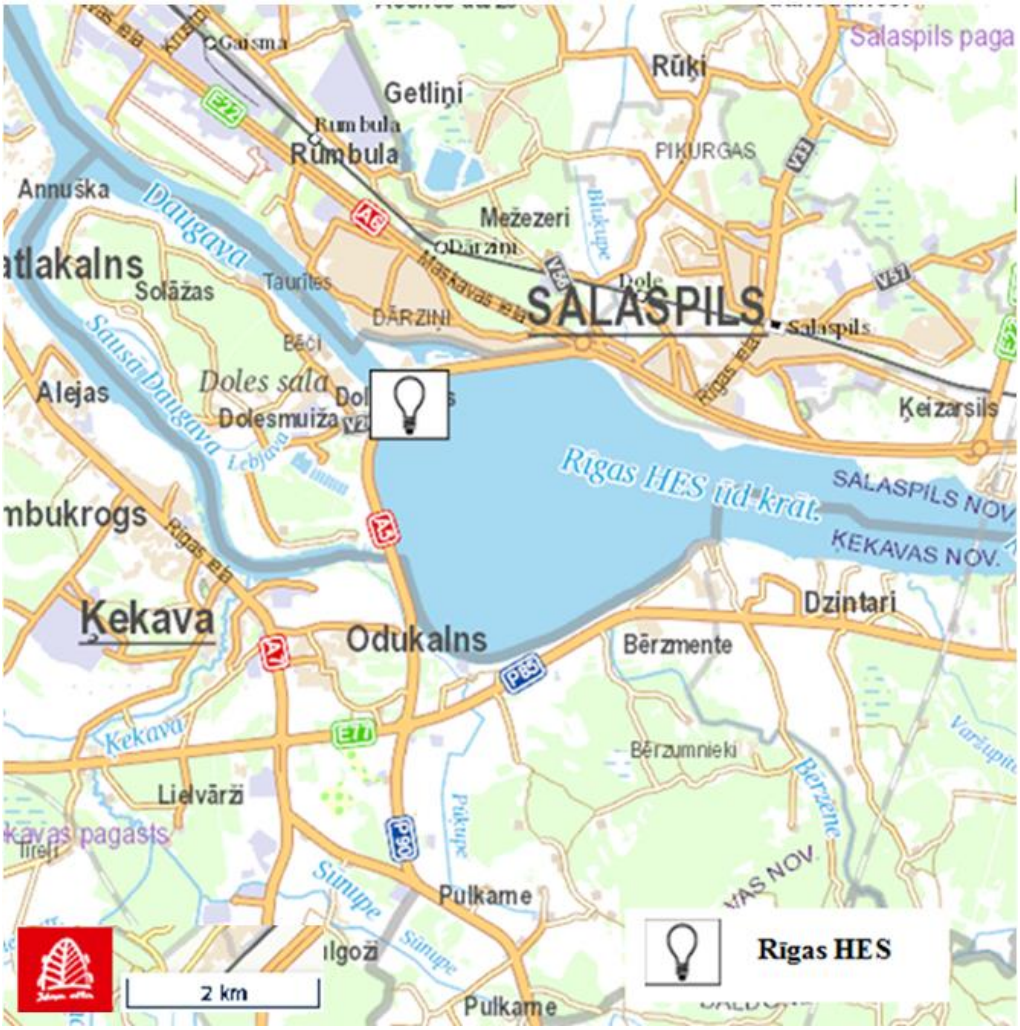
Name of Object of increased danger: Joint Stock company Latvenergo power plant Riga HPP**,** Unified registration number No.40003032949. Legal address: Pulkveza Brieza street 12, Riga, LV-1230, Latvia, Phone: (+371) 67728222, fax: (+371) 67728880, e-mail: info@latvenergo.lv

Riga HPP location: Dole island, Salaspils region, LV-2121, Latvia, phone: (+371) 67724350, fax: (+371) 67724332, e-mail: kanceleja@latvenergo.lv

2. Information about geographic location of Object of increased danger and object local meteorological, hydrological and climate description

2.1. Geographic location

Administratively RHPP is located on Dole island, in Salaspils region, 4 km away from city Salaspils (see 2.1.picture).



2.1. picture Riga HPP location

Geographic coordinates: 56°50` ZP and 24°14` AG; Latitude and longitude *coordinates*: x = 6300,020 and y = 515,171.

On the river Daugava right and left banks the power plant is accessible from the road A5 that in 1km to the North is connected with the road A6 Riga – Daugavpils.

2.2. Ambient meteorological, hydrological and climate description

According to the information obtained from Latvian environment geology and meteorology centre the range of average ambient air temperature is from -3,7^{o}C in February to +17,4^{o}C in July. Absolute minimum air temperature with probability once per 50years is -34,8^{o}C and once per 10 years -30^{o}C. Absolute maximum air temperature with probability once per 50years is +33,30^{o}C and once per 10 years +32,20^{o}C.

Annual precipitation is ir 692 mm, and day-and-night average relative humidity annually is 81%.

In accordance to the data approved by State Construction Control Bureau of Latvia probable maximum flood (further in the text - PMF) Riga HPP water flow rate is 12800 m^3/s. River Daugava has characteristic wide range of variation in flow. During dry summer and winter seasons the water flow decreases to 100 – 150 m^3/s, but during the flood the flow can increase up to 4000 – 8000 m^3/s. Average annual flow is 600 m^3/s.

3. Description of Object of increased danger and its operation

Riga HPP according to the Law regarding Hydro Power Plant hydrotechnical structure safety has been classified as hydrotechnical structure safety class A structure (the structure that in case of emergency can cause risk to person's life and health and significant damage to the private and commercial property as well significant damage as to the environment) and such structures according to the Section 2 requirements of the Cabinet Regulation No.563 "Procedures for Identifying and Determining Objects of Increased Danger, as well as for the Planning and Implementation of Civil Protection and Disaster Management" adopted on September 19, 2017 are included in category A Objects of increased danger.

Riga HPP is included in the list of in category A Objects of increased danger in accordance to the Cabinet Regulation No.568 The list of Objects of increased danger adopted on September 11, 2018.

Riga HPP dam consists of concrete and soil constructions. Main concrete construction is hydro power plant building, which consists of two blocks separated by expansion joint, spillway dam and its upstream apron, intake channel and stilling basin.

Above the Riga HPP dam there is man-made reservoir. Water reservoir serves for energy accumulation and flood control. It's storage capacity is 256 million m^3 at the normal water level in reservoir (all level marks are given as per Latvian standard altitude system (LAS-2000,5)).

3.1. Working hours, amount of personnel in the Power Plant during and outside normal working hours

Working time for permanent workers: working hours from 8:00am to 5:15pm, on Fridays from 8:00am to 4:00pm, 8 hour working day, 40 hours working week. Operating shift: continuously 24hours form 7:00am to 7:00pm and from 7:00pm to 7:00am.

3.2. Technological processes and equipment

The main task of Riga HPP is the same as for other power plants to produce electricity by providing power supply during peak hours. Besides that hydro power plants fulfills the role of power system emergency reserve – in case of emergency can produce electricity to provide end users with an uninterrupted power supply as well as controls voltage and frequency in the system.

Riga HPP water head is 18 m, and total installed capacity 402 MW.

Riga HPP reservoir with total storage capacity 256 MM m³ (useful capacity 35 MM m³) is specific hydroelectric energy battery. Water flow through the power plant is 12040 m³/s, including through spillway– 8695 m³/s, through all six turbines 3345 m³/s (through one turbine at calculated head 12,9 m – 607 m³/s).

Main equipment

For power generation 6 Units are used.

Stop logs and its lifting equipment are considered as mechanical equipment of hydrotechnical structures.

Also wo three-phase transformers are considered as main electrical equipment.

3.3. General description of technical systems and auxiliaries

3.3.1. Water supply

Riga HPP raw water (for Unit and transformer cooling) is supplied from RHPP reservoir through filters.

Water for firefighting system is supplied from two separate systems:

- Dole island water supply system, water is supplied to firefighting yard hydrants and potable water for RHPP and Property management department needs.
- The water for RHPP is supplied from reservoir through fire fighting pump station, the water is supplied to RHPP technological equipment, automatic fire fighting equipment, all internal fire fighting pipeline hoses and one external Moscow type hydrant.

Downstream of the river Daugava on the left bank the water to the fire trucks is supplied from the water source built specially for fire fighting purposes.

3.3.2. Wastewater system

Riga HPP has separate rainwater (surface water) drainage system which is discharged staight to the river Daugava. Considering the fact that the rainwater has no pollution the water treatment and/or special activities are not required. Wastewater is drained through biological treatment system and discharged to the river Daugava.

The waste water from the floor in Power plant is discharged to the oil separator tanks. After the oil has settled the water is filtered through biological treatment system, after periodic testing of the treated wastewater quality (qualitive and quantitative testing) the wastewater is discharged to wastewater system.

3.3.3. Power supply

Riga HPP main power supply consists of following:
- two 20 kV voltage lines from sub-station „Ķekava" 20/6/0,4 kV;
- Riga HPP Unit 1 and Unit 2 generators with voltage 13,8/0,4 kV;
- TSO (*AST*) 330 kV sub-station N7 lines LN319 and LN320 330/13,8 kV.

Alternative power supply sources will be used in case of simultaneous self consumption (20 kV and 13,8 kV) loss.

Riga HPP power supply disconnection is done by operating personnel.

3.3.4. Heat supply

Working, technical and resting rooms in Riga HPP has electrical heaters, the water is heated (+95°C) by the electric boilers.

The temperature in industrial premises is controlled by heat distribution systems and air duct heaters.

3.3.5. Ventilation

Riga HPP building rooms has balanced ventilation system with air supply and exhaust vents. The part of the ventilation system is automated, the temperature in the room is controlled by the temperature sensors.

In case of fire the ventilation system in the cable room is automatically deactivated and ventilation ducts are automatically closed by safety valves.

In office rooms the comfortable temperature is controlled by automated conditioning system.

3.4. Power plant security system

The power plant has security system.

3.5. Power plant risks, including dangerous equipment and maximum amount of produced, used, managed or stored dangerous substances

3.5.1. Dangerous equipment

Riga HPP has been determined the following dangerous equipment:
- Lifting equipment;
- Pressure equipment;
- stationary tanks and its groups.

3.5.2. Dangerous substances and products

Turbine oil, transformer oil and diesel are used in technological processes of Riga HPP.

3.5.3. Riga HPP reservoir water storage and spillway capacity

Riga HPP is hydrotechnical structure with total water storage capacity in reservoir 324,6 MM m³ (useful capacity 34,6 MM m³) at normal water level (18,15 m amsl) (NWL).

Maximum spilway capacity at normal water level in reservoir (18,15 m amsl) (NWL) is 8695 m^3/s. If all 6 Units are in operation and all stop logs are closed the maximum spilway and turbine capacity is 12040 m^3/s at NWL and 13230 m^3/s at MWL.

3.5.4. Internal risks

Risk assesment for most potential internal and external risks has been carried out within the Project of safety of the Daugava HPP hydrotechnical structures and the results are presented in respective reports [1, 2, 3].

Riga HPP internal risks consist of:
- failure of construction expansion joint and leak;
- construction displacement and settlement;
- filtration through earth dams;
- fire;
- damage or failure of main equipment;
- human errors or sabotage.

4. Risk assesment summary for objects of increased danger

In civil protection plan are included the following potential risks for Riga HPP:
- concrete, dam and soil resistivity issues;
- earthquake;
- flood and ice floating;
- storm and heavy rain;
- hard freeze and ice;
- bioterrorism;
- heavy vehicle accident on HPP bridge or nearby;
- fire;
- hazardous chemical substance, oil and fuel leak;
- human errors and sabotage;
- terrorism, notifications about explosive material location;
- transmission system failure;
- damage or failure of main equipment;
- water level increase above allowable upstream level mark;
- water level increase above allowable downstream level;
- dam failure and dam crisis situation.

[1] Daugava dam safety consultants. 2.1.final report: Detailed risk assesment of three Daugava HPP dams, year 2002.

[2] Daugava dam safety consultants. Riga HPP internal emergency action plan, year 2003.

[3] Daugava dam safety consultants. Work execution summary., year 2003.

5. Information about territory of the object of increased danger that may have impact of accident, including information about number of people and nearby located objects that may have impact of an accident in the object of increased danger

The closest public and commercial buildings in Salaspils city are located ~1,2 km away from RHPP. No other objects of increased danger are located nearby RHPP (within ~1,5 km range). As increased manmade hazard is considered the road bridge (highway A5 Riga bypass road Salaspils – Babite) that runs along the Riga HPP building at elevation +14,45 amsl, close to the main transformers (distance ~3 m) and may cause hazardous accident risk.

Calculating the distance from the power plant perimeter nearby Riga HPP are located:

- to the North: highway Riga – Daugavpils (A6) – dangerous vehicle area – 1,2 km; AS „Latvijas dzelzceļš" freight transport section of Riga – 1,4 km; building plots of gardening association „Dārziņi" – 0,5 km;
- to the Nort East: railway stations Dole and Salaspils – 1,0 and 1,2 km; Salaspils city (calculating the distance from dam right bank) 0,3 to 4,2 km; Saulkalne – 5,2 km;
- to the East: Daugava river, Riga HPP reservoir;
- to the South East: Daugmale administrative region – 7,4 km;
- to the South: Riga HPP reservoir;
- to the South East: Dole island; Ķekava administrative region (calculating the distance from dam left bank); highway Riga – Bauska (A7) – 4,0 km;
- to the West: the Dry Daugava – 3,0 km;
- to the North West: Daugava river, Dole island.

There is potential risk of downstream area flooding as a result of Riga HPP structure collapse, that may cause danger for human, materials and environment. In case of dam failure will lead to downstream area flooding that may cause danger to 110825 people [4].

6. Information about civil protection organisation in the object of increased danger and information about responsible employees and their responsibilities

6.1. Person, who makes decision to start implementation of civil protection plan, activity coordination, accident hazard and risk reduction measure management on Site in case of accident or immediate threat and who is responsible to take actions to eliminate the emergency consequences

Decision to start implementation of civil protection plan in Power plant shall be made by the responsible for Civil protection– HPP technical director.

Activity coordination, accident hazard and risk reduction measure management on Site in case of accident or immediate threat shall be carried out by Riga HPP director.

Riga HPP director is responsible for actions to eliminate the emergency consequences.

[4] Daugava dam safety consultants. Riga HPP internal emergency action plan, year 2003

6.2. Person, who is responsible for daily communication with State Fire and Rescue Service and other institutions and cooperation with aforementioned institutions in case of accident or immediate threat

Riga HPP director is responsible for daily communication with State Fire and Rescue Service and other institutions, phone: (+371) 67724350, e-mail: kanceleja@latvenergo.lv

In case of accident or immediate threat Riga HPP dispatcher is responsible for *cooperation* with State Fire and Rescue Service and other institutions, phone: (+371) 67724352 and (+371) 29456412.

6.3. Information about employee responsibilities related to civil protection and accident prevention and elimination of consequences on Site

Organisation of civil protection is determined by „AS „Latvenergo" procedure for civil protection management".

Employee responsible for organisation of civil protection is Safety director in AS Latvenergo appointed by Order issued by AS „Latvenergo" General director.

Responsible employee duties for civil protection organisation in AS Latvenergo:

- to co-ordinate, control and improve AS „Latvenergo" Civil protection system;
- to organise development and update of internal regulatory enactments necessary for system life cycle;
- in co-operation with other departaments, as well as Operational services, State institutions, Municipalities and National Armed Forces shall ensure implementation of Civil protection activities in AS „Latvenergo" power plants;
- in co-operation with other departaments shall organise not less than once a year staff trainings related to Civil protection issues in AS „Latvenergo" power plants, which has Civil protection plans;
- to organise and provide in co-operation with other departaments the development, reassesment, if necessary, update and not less than once per three years to test preparedness measures of Civil protection plans in objects of increased danger.

Employee responsible for organisation of civil protection is Safety director in Riga HPP of AS Latvenergo appointed by Order issued by AS „Latvenergo" General director.

Responsible employee duties for civil protection organisation in AS Latvenergo power plant Riga HPP:

- to manage preventive, response, elimination of consequence measures in power plant, resource management preparedness;
- to arrange staff training related to civil protection issues;
- to arrange and manage incident and elimination of consequence measures, and to organise department work in accordance to the respective department action plans and according to the situation;
- to manage incident command structure response;
- to arrange development of activity plan in case of danger.

Responsible for making the decision for implementation of early warning and informing about incident, emergency and crisis situations or in case of threat is HPP Technical director in Riga HPP of AS Latvenergo appointed by Order issued by AS „Latvenergo" General director.

Duties of responsible employee who makes the decision for implementation of early warning and informing about incident, emergency and crisis situations or in case of threat in objects of increased danger:

- if there is a threat to employee's life or health the decision on evacuation and informing the employees who are in the power plant shall be made immediately;
- if there is a threat to people's life or health who are present in hazard area outside the power plant, or there is a threat to people, environment or property, the decision on informing the people who are in the hazard area shall be made immediately, as well as informing the State and Minicipality institutions.

For implementation of Civil protection activities in incident, emergency and crisis situations in Riga HPP of AS Latvenergo are appointed by Order issued by AS „Latvenergo" General director the following responsible persons:

- Riga HPP Director;
- Riga HPP Dispatch department manager;
- Riga HPP electrical and mechanical equipment department manager;
- Riga HPP Relay protection and automation department manager;
- Hydrotechnical structure department manager.

Duties of responsible persons who implement incident, emergency and crisis situation activities:

- To manage activities of response and elimination of consequences in the power plant, to manage necessary resource preparedness;
- To carry out civil protection training on site for the employees and employees involved in civil protection activities;
- to carry out activities related to incident investigation and eliminate emergency consequences on Site according to their competences and to organise department works in compliance with respective department action plans and taking into consideration the situation;
- to ensure emergency alert system operability;
- to develop power plant activity plan for incident cases;
- in case of incident to notify Transmission system operator (AS „Augstsprieguma tīkls"), support department, operations department, State institutions and local Government.

Responsibilities of RHPP dispatch service dispatcher's on duty:

- directly manages elimination of technological disruptions;
- liable for accuracy for elimination of technological disruption;
- after technological disruption occured the dispatcher on duty shall carry out notification in accordance to the „HPP Technical management department power plant dispatcher's notification procedure regarding events in the hydro power plant";
- during elimination of technological disruptions the dispatcher's on duty shall be in RHPP control room;
- upon RHPP department manager arrival and to accelerate the maintenance works, if necessary, the dispatcher on duty shall call the required equipment maintenance department service personnel (IRD);
- after elimination of technological disruptions the RHPP dispatcher, who managed the elimination works shall prepare a report.

Responsibilities of department manager who manages the elimination of technological disruption consequences:

- shall act under dispatcher's supervision as the manager for elimination of technological disruption consequences;
- the works shall be carried out taking into consideration all safety measures the same as during normal working conditions;
- the works shall be arranged by issuing a work assignment. Additionally all work safety requirement shall be considered despite the urgency.

Responsibilities of department manager who is in the power plant during the technological disruption and who follows the process for elimination of technological disruption:

- shall act under dispatcher's supervision as the manager for elimination of technological disruption consequences;
- shall give necessary instructions about equipment maintenance during technological disruption conditions;
- during technological disruption is in the power plant territory.

Responsibilities of RHPP operator on duty:

- shall notify the RHPP dispatcher about all equipment operation distruptions;
- shall act under dispatcher's supervision as the manager for elimination of technological disruption consequences;
- shall be in the workplace and shall take all activities to ensure normal equipment operation and to prevent development of technological disruption;
- shall notify the RHPP dispatcher about leaving the workplace. The operator may leave the workplace only:
  - if there is direct hazard to human health;
  - to provide first aid to injured person;
  - to carry out necessary works for equipment preservation;
  - upon technological disruption manager's order.

RHPP operational staff on duty shall act based on the following requirements for elimination of technological disruption:

- shall carry out activities immediately to prevent threat to personnel and equipment, even to stop the equipment if needed;
- shall not interfere in operation of automated equipment (in accordance to LEK 002 „Technical maintenance of energy facilities");
- shall carry out activities to ensure power plant self consumption and normal operation of the equipment in operation;
- by taking into consideration measurements of measuring devices and external features operational staff shall create a general concept on what has happened and shall verify the defective area, kind of defect and scope of defect as close as possible.

Personnel on duty shall stay at their workplaces until technological disruption has been eliminated and power plant is back in normal operation.

7. Information about employee training for emergency preparedness, civil protection and first aid

Employee responsible for civil protection in AS „Latvenergo" power plant Riga HPP shall plan and organise employee theoretical and practical training in civil protection and disaster management. Theoretical training must be provided once per year in accordance to the Cabinet Regulations No.716 „ Minimum Requirements for the Content of the Mandatory Course in Civil Protection and the Content of Training of Employees in Civil Protection", and employee shall gain:

- knowledge about object civil protection plan;
- knowledge about possible disasters in the state and its consequences;
- knowledge about state early alert system;
- knowledge about agencies that provides disaster management;
- knowledge about civil protection system;
- first aid skills in critical emergency cases, as well as to call emergency assitance.

In accordance to the requirements of the Cabinet Regulations No.563 „ Procedures for Identifying and Determining Objects of Increased Danger, as well as for the Planning and Implementation of Civil Protection and Disaster Management" adopted on September 19, 2017, civil protection and disaster management practical training shall be arranged not less than once per three years.

Practical fire safety training shall be arranged once per year in accordance to the Chapter "Actions in case of fire" of the Fire safety instruction in Riga HPP (IU054).

Company's employees shall have First aid training in accordance to the Cabinet Regulations No. 713 „Regulations on procedure how the first aid training shall be provided and minimum requirements for first aid kit" adopted on August 3, 2010. The training is arranged in accordance to the established time schedule and provided by certified company.

8. Description bout measures that reduce employee risks in their workplaces and other persons that are in the territory of increased danger

8.1. Employee warning about threat, notification about actions in case of emergency and disaster, and protection measures to be taken as well as further notification

Fire alarm and evacuation alert system is installed in Riga HPP rooms and territory, system microphones with function keys for zone selection are located in Main control room and security monitoring room.

Employee anouncements are distributed to separate zones and zone groups, as well as within whole plant. Microphones are used to broadcast necessary information.

Early alert system is installed in the Machine hall which can be switched on manually from Main control room.

Riga HPP dispatcher by receiving notification about incident in HPP territory shall act in accordance to the HPP dispatcher's notification procedure regarding events in the hydro power plant, by notifying State Fire and Rescue Service (VUGD).

8.2. Short desription about employee necessary actions to be taken after notification received

Power plant employees, that are not involved in accident elimination activities, after alarm signal is on or verbal warning received from responsible person shall immediately without panicking leave the power plant building by using the nearest evacuation exits and routes where evacuation is possible or following the responsible person's instructions and shall go to assembly point. Employees, that are involved in fire or accident elimination activities, shall act in accordance to the technological instructions and action plan in case of fire.

8.3. Safety measures for employees and other persons that are in the power plant territory

Safety measures for risk reduction of the employees and other persons that are in the power plant shall be considered. The persons shall be instructed about procedure for maintenance, work safety, fire safety and activities to be taken in case of emergency prior to start the works, warning and information sign location inside the power plant and within the territory, prohibition to be in areas where unauthorised persons shall not access, signs about possible evacuation routes in case of emergency, use of respective personal protective equipment.

9. Emerging threat and external notification event system description

9.1. Emergency and emerging threat registration procedure

The power plant dispatcher registers emergency, emerging threats and its development in chronological order in Riga HPP operational event log.

9.2. Procedure on how the responsible person notifies the State Fire and Rescue Service, respective authorityand other institutions about emergency or emerging threat

After receiving an information about emergency or emerging threat the power plant dispatcher shall act in accordance to the incident command structure response, immediately notifies State Fire and Rescue Service by dialing single emergency number 112, by providing the address or location of the fire, emergency or emerging threat and the name, surname of the person calling, as well as shall provide additional requested information. If there are injured persons then emergency medical care can be accessed by calling 113.

After the State Fire and Rescue Service has been notified the power plant dispatcher shall act in accordance to the notification procedure about events in HPP technical department.

9.3. Information that shall be included in the initial warning and procedure on how the further information as well as detailed information, as soon as available, is provided

The following information shall be included in the initial warning:

- location of the emerging threat or emergency in the power plant;
- information about evacuation, and also which evacuation routes are forbidden to use;
- assembly point.

By receiving further information the responsible person repeats the notification to the employees by including received information.

Message text – Attention, attention to all who are in the Riga HPP territory, here (specify position, name and surname) is speaking. There is an emergency situation in Riga HPP (power plant area or zone), please immediately leave a zone (name exact dangerous zone) exposed to danger by using nearest and safest evacuation routes. During evacuation (name specific evacuation routes) and elevators shall not be used. Proceed to your nearest assembly point (specify where).

9.4. Procedure on how the power plant personnel, sub-contractors, sub-lessees, visitors and also residents are notified

Power plant personnel as well as other persons that are in the power plant are notified about emergency situations by using existing emergency alert systems in the power plant and by providing information about dangerous zone, emerging threat, evacuation routes and assembly point. Notification text is broadcasted in latvian and russian languages, but if there are foreigners in the power plant then notification is broadcasted also in english. Evacuation notification broadcasting time shall not be shorter than evacuation time. In addition all possible communication devices (phones, walkies-talkies) shall be used, if needed. Residents living nearby the power plant are notified by using outdoor warning system - civil defense siren.

Notification shall be done by power plant dispatcher on duty or security officers.

10. Information about activities that:

10.1. ensures the restrictions and elimination of an emerging threat, that the threat doesn't turn into emergency situation, but in case of emergency – ensures the restriction, control and elimination within the power plant territory of increased danger, as well as to reduce the impact and damage of emerging threat or emergency

To ensure safe generation process, to prevent power plant emergency cases, but in case of emergency to restrict and reduce consequences and succesfully eliminate them the following shall be considered:

- operation and maintenance manuals, safety instructions, fire prevention instructions and other necessary instructions shall be developed;
- employee action guidelines shall be included in the instruction to prevent the possibility of potential emergency situations;
- in the instructions are included requirements that regulate implementation of labor protection, fire safety and civil protection norms;
- Riga HPP employees shall regularly have instructions (labor safety, fire safety, civil protection), as well as trainings;
- Riga HPP action plan for risk reduction has been developed for period from 2019 to 2025;
- Riga HPP action plan in case of hazardous substance leakage and clean-up as well as for fire and explosion cases has been developed;
- „Daugava HPP hydrotechnical structures safety improvement plan for 2011-2025" has been developed;

- „PHPP, KHPP and RHPP hydrotechnical structures safety programms" have been developed;
- „Civil protection plan" has been developed;
- „Fire safety instruction for Riga hydro power plant" has been developed;
- „Riga HPP instruction for elimination of technological disturbances" has been developed.

In Riga HPP an automated data collection system has been installed to control technical condition of hydrotechnical structures. Data collection system is real time system that consists of computers, data collection devices and sensors.

hydrotechnical structure automated monitoring system task is to receive and to store continuous and simultaneous measurements that are used to control condition of hydrotechnical structures. Riga HPP automated monitoring system has 498 measurement points or 1946 measurement parameters that are located in power plant building in the hydrotechnical structures on the right and left banks of the river Daugava.

Daugava HPP hydrotechnical structures safety improvement plan for 2011-2025 has been developed. Documents about technical condition of the equipment are analysed each year and are prepared equipment maintenance schedules.

10.2. Related to human and environmental protection in the objects of increased danger in case of emergency

In case of emergency spilled oil from transformers is collected in the the water-oil sump tanks under the transformers from where the water-oil mixture is drained to water-oil separator and after treatment the water is discharged to wastewater system, but oil is collected and handed over for waste management. In case of emergency operations personnel shall act in accordance to the „Riga HPP instruction for elimination of technological disturbances". People who are involved in elimination of emergency consequences shall use the personal protective equipment (protective clothing, footwear, rubber gloves).

In case of oil spills in the river Daugava the containment booms are placed/pulled across the river Daugava by State Fire and Rescue service to control the spread of oil and to prevent further oil spreading downstream the river Daugava. The oil is collected from the water surface by certified company for further waste management.

Information provided in product safety data sheets about product dangerousness and activities to be taken during emergency is considered prior taking actions with hazardous substances and mixtures.

The employees as well as sub-contractors being in the power plant territory shall follow the general fire safety and labor safety requirements, as well as particular requirements for works in specific workplaces. Prior to start the works the employees as well as sub-contractors are informed about particular requirements for works in specific workplaces.

10.3. To prevent the spread of emergency consequences outside the object of increased danger

RHPP general goal is to prevent or reduce the possibility of emergency or damage due to emergency where due to the properties of an equipment, chemical substances and mixtures used in the power plant can cause damage to environment and human health. Water-oil sump

tank under the transformers serves as preventive measure for spread of emergency consequences.

In case of emergency and possible threat operations personnel shall act in accordance to the „Riga HPP instruction for elimination of technological disturbances".

To prevent spread of emergency consequences outside the power plan territory the localisation of consequences shall be carried out in emergency zone.

10.4. To ensure inhabitant notification and further timely information communication to inhabitants endangered territory where necessary

Right after emergency happened or development of emerging threat the neighbouring companies, inhabitants will be notified via Riga HPP warning system - civil defense siren as well as after evaluation of the situation seriousness, mass notification will be carried out by emergency services (State Fire and Rescues service, Municipal police).

A must for inhabitant evacuation is determinable after evaluation of actual situation and further possible development forecast (for example, wind direction changes, increase of fire, leakage, flood risks).

10.5. To provide evaluation of polluted environment, sanitary measures and environment recovery in order to mitigate emergency consequence impact on humans and environment

Riga HPP environment polluting substance spill control and countermeasure plan includes the following information:

- Determination of critical zones, that may have impact due to spill;
- List of available equipment that may be used for collection of spilled substance and sanitary measures;
- Location of respective storage areas;
- Notification procedure etc.

Main principles how to act in case of emergency caused by any oil product or other hazardous substance spill:

- During collection activities always access the hazardous substances from upstream, highest point and leeward side;
- It shall be considered that toxic substances that cannot be seen or smelled;
- Secure the area, determine larger possible area prior arrival of respective operational person;
- Reduce any impact, forbid the passage through/in an area where the spill is suspected;
- Isolate the area and forbid assage of persons earlier not exposed to danger.

The companies with whom the contracts will be concluded will be involved for inspection, sanitary measures and environment of polluted area.

11. Detailed description of major measures to be taken in case of emergency

11.1. Evacuation procedures

People evacuation is done via evacuation routes specified in the evacuation plans. For evacuation emergency exits are foreseen in all buildings, there are 2 assembly points in power plant territory. Emergency exits in HPP buildings are marked with respective evacuation signs. Power plant emergency exits and evacuation routes, as well as assembly points are specified in the Annex 2 "Riga HPP plan where the main buildings, balance of plant, emergency exits and evacuation routes, fire fighting equipment, early warning devices, fire hydrants, hazardous substance storage areas". As soon as person has been evacuated from dangerous area it shall be ensured if the person needs first aid care and emergency service shall be called.

Material assets collected during evacuation shall be placed in safe place where they cannot be damaged or doesn't interfere with fire fighting. Persons shall be assigned to protect against theft and supervise the material assets.

11.2. First aid and emergency care measures for injured persons

In case of accident at work with RHPP employee(-s) first aid care shall be provided by power plant employees or contractor employees. After the emergency medical service has been called an emergency care to RHPP employee(-s) is provided by emergency medical service personnel.

Decision about neccessary (additional) State emergency medical service personnel shall be taken by emergency medical service doctor, who first has arrived at the place of accident. The doctor is responsible for triage of injured persons during medical disaster.

During emergency (fire, hazardous substance spill, structural collapse) the designated area for State emergency medical service personnel on duty is indicated by State Fire and Rescues service, at the same time identifying additional areas in cases if the situation is changing, incl. flue gas, hazardous substance gas-steam cloud spread direction. Care to injured persons is provided in clean, safe area (atmosphere). Transportation of injured persons from accident area to medical care area is carried out by State Fire and Rescues service personell (fire fighters - rescuers).

Injured person evacuation accident area to hospital is carried out by State emergency medical service with their transport. Identification of dead bodies and dead body transportation away from accident area is carried out by State police with their transport.

11.3. Maintenance of public order and property security in the object of increased danger

Maintenance of public order, if required, is provided by Riga HPP security department in accordance to the concluded contract. Maintenance of public order outside the guarded territory is provided by State police employees and the Road police employees in case of road traffic accident.

In case if needed the power plant security may involve 2 security reaction teams from their company.

11.4. Operation or safe shut down measures of the power plant of increased danger

Riga HPP equipment fault mitigation methods, personnel actions in case of technological disturbances are stipulated by „Riga HPP instruction for elimination of technological disturbances". The term "fault operative mitigation" means disconnection of damaged equipment from power grid, as well as activities to be taken with the aim to:

- Prevent spread of disturbances, prevent dangerousness to personnel and equipment which were not impacted by disturbances;
- renew power supply to users and restore power parameters to normal state (frequency and voltage);
- Ensure power plant most safest operation during disturbances;
- Clarify the equipment condition to be shut down during disturbances and possibility to start-up the equipment.

In accordance to LEK 002 the power plant personnel on duty shall immediately and without any objections to follow the orders by power grid dispatcher on duty, except the orders which endangers the safety of personnel and the equipment safety.

The equipment that has tripped during disturbances and if it is needed for power plant operation it shall be restarted after the equipment has been checked for readiness for operation. Power plant dispratcher shall immediately notify the Transmission system operator (TSO) about disturbance circumstances and its development. The exceptions are only local disturbances that doesn't have impact on electrical power network and which can be mitigated by the local personnel. After mitigation of these disturbances the TSO dispatcher shall be notified.

After mitigation of the disturbances and the power plant shall be returned back to the normal operation and the damaged equipment due to disturbances shall be restored. Disturbance consequence mitiogation are managed by department managers.

In all cases the personnel on duty by notifying TSO may take the following actions for mitigation of disturbances:

- Disconnect the equipment, if there is real danger to the personnel and equipment safety;
- Without inspection energise the busbars that have been de-energised during disturbances, only if the people are not working inside the switchgear;
- Start up the auxiliary equipment;
- If the power plant has been disconnected from the grid, take actions to ensure self consumption for HPP. Connection renewal with the grid shall be done upon TSO permission or based on the TSO Order.

11.5. Actions to be taken after accident that are needed to prevent, mitigate or significantly reduce accident impact on the people or environment

After accident check the people health condition. If needed, first aid cure shall be provided to the injured people.

In order to have less impact on evironment after accident the oil spill shall be mitigated immediately, oil spill shall be tracked and collected (spilled oil from the source shall be collected, restricting the oil spread in the environment by involving State Fire and Rescue service to organise oil collection from the water surface, as much as possible to avoid polluting the main water steram passing through Riga HPP).

In case of hydro technical structure damage as much as possible to reduce the water flow into the reservoir, damage elimination and structure repair works shall be arranged.

12. Description about actions for reduction or restriction and situation control of emerging threat or unwanted accident consequence scope or level of heaviness

Initial task for reduction of unwanted accident consequence scope or level of heaviness is care of power plant employee and other person health and life by evacuation of all people from the power plant. For evacuation in all buildings are foreseen evacuation routes, in power plant territory there are 2 assembly points. Emergency exits are marked with evacuation signs.

To prevent the threat to other persons after accident occurred (fire, oil spill) the restriction of people and vehicle movement in thethreatened territory will be arranged by involvement of State and municipal police personnel. The restriction will be arranged to prevent unauthorised access to enter the power plant in emergency condition.

In case of oil spill the damaged equipment shall be shut down as soon as possible, shut down the pressure supply, the oil shall be collected in oil containers.

In case of danger of collapse of the power plant building, the water level in reservoir shall be lowered as much as possible, inhabitants living downstream shall be notified and depending on predictable damage the inhabitants shall be evacuated.

When the emerging threat or emergency case has been identified HPP employees shall immediately notify the power plant dispatcher and their direct manager. To the best of their abilities, they shall prevent the spread of emergency without jeopardizing their safety.

HPP dispatcher department personnel actions are to call responsible services, to arrange employee and Constractor employee evacuation, to collect the information about the number of people employed, to carry out activities for safe mitigation of emergency and emergency consequences.

All power plant equipment shall be protected from emergency, first of all the main to be protected, that generates the power and the heat and are located near potential hazards.

13. Description of resources

13.1. Resources available in the object of increased danger

13.1.1. Early warning system, communication assurance

For an emergency alarm system the following alarm systems may be used:

- Security alarm system is installed in Riga HPP administration building, in the warehouses and is connected to RHPP security control room;
- Fire alarm system has t° and fibre optic sensors connected torelay hall in administration building;
- Control panel (computer) is located in the control room.

Maintenance of communication facilities is done by AS Latvenergo ITT department, maintenance of all types of alarms and alert systems is done by Safety department,

maintenance of fire alarm system equipment is done by RHPP relay protection and automation department.

Alert system has uninterrupted power source (UPS), that will provide emergency power for 25 minutes for system operation in case of power fails, sufficient time for evacuation of people.

13.1.2. Fire protection and fire fighting systems and equipment

Fire detection and alarm system is installed in Riga HPP to ensure the room fire safety. HPP buildings, assembly bay and administrative building office rooms are connected to the fire detection and alarm system.

Automatic fire suppression system is installed on hydrogenerators, 330 kV transformers, cable rooms and cable channel.

HPP buildings and structures are equipped with fire extinguishers and accessories in accordance to the requirements of Fire safety regulations, where the number of fire extinguishers are selected depending on room fire hazard level, area and required ability to extinguishing capacity. In addition to the fire extinguishers there are also fire fighting accessories available.

13.1.3. Personal protective equipment and procedure for the use

Respective Personal protective equipment intended for use in the power plants is available for RHPP employees.

13.1.4. List of materials for the First aid and their location in the power plant

In case of accident at work with RHPP employee(-s) first aid care shall be provided by power plant employees or contractor employees. Based on AS Latvenergo Order requirements the medical materials needed in giving the first aid are available at Riga HPP.

After the emergency medical service has been called an emergency care to RHPP employee(-s) is provided by emergency medical service personnel.

Injured person evacuation accident area to hospital is carried out by State emergency medical service with their transport.

13.1.5. Machinery, vehicles, tools, special wear or reserve

Vehicle and machinery resources available at Riga HPP are specified in annex 22.

For Riga HPP civil protection system needs the necessary and available machinery and vehicles are located in Pļaviņas, Ķegums, Riga HPP's, Riga TPP-1 and Riga TPP-2 territories (garages), however from the legal point of view are in the possession of AS Latvenergo transportation department, respectively the use of the machinery and vehicles in RHPP civil protection activities is possible with respective transportation department consent.

Reserve power supply to the main consumers will be provided from three different power supply sources.

13.1.6. Emergency spread control equipment, emergency leak collection equipment and tanks, defensive walls, emergency pollution detection equipment and other equipment for people safety and environment protection

Riga HPP **spillway** consists of 6 spans with radial spillway gates. Spillway maximum discharge capacity at the normal water level in reservoir (18,15 m amsl) (NWL) is 8695 m^3/s. Respectively at the maximum water level in reservoir 18,95 m amsl (MWL) spillway discharge capacity is 10030 m^3/s. In addition all 6 hydrounits maybe operated with total discharge capacity at NWL is 3345 m^3/s and at MWL– 3470 m^3/s. Reservoir discharge rate is limited by the parameters defined in the design and in the Permit for the use of water resources.

Drainage system in the power plant building is foreseen to prevent chemical pollution, spilled oils are drained to tanks located on elevation -4,15 m where the substances are collected for treatment and disposal. Lielrīga Regional Environment Depertment shall be informed in case of oil spill and collection of spilled oil shall be organised.

13.2. Resources to be supplied by other merchants in accordance to the cooperation and mutual assistance agreement as well as the time within which the respective resources can be received

In case, if needed for implementation of Riga HPP civil protection system the external resources will be involved based on mutual cooperation agreements.

Mutual cooperation agreements are concluded with:

- State Fire and Rescue Service;
- Latvian National Guard.

For collection and disposal of hazardous substances it is foreseen to involve other companies, if needed, by signing agreements with them.

14. Information about the response time for State Fire and Rescue Service and other emergency services from the time of call to the arrival to the place of incident

In accordance to the Clauses 6 and 7 of the Cabinet Regulations No.297 "Procedures by which the State Fire and Rescue Service Performs and Manages the Fire-fighting and Rescue Operations" Adopted on 17 May 2016, where it is stated that the subunit of the State Fire and Rescue Service after departure from the nearest fire station shall arrive to the Riga HPP territory within 23 minutes. The time of arrival may be longer if the arrival has been delayed by *force majeure* circumstances, a natural or man-made disaster has occurred, several notifications of several events within the region for which the fire station or post is responsible have been received or on the way to the place of the event traffic complications have occurred or received notification of an event is not related to a fire and the human life or health is not at risk.

In accordance to the Clause 122 of the Cabinet Regulations No.555 " Procedures for the Organisation of and Payment for Health Care Services" Adopted on 28 August 2018, where it is stated that the Teams of the State Emergency Medical Service in Riga HPP territory after receipt of emergency call in 75 % of cases emergency medical assistance is provided within 25 minutes from the time of receipt of the call.

15. Procedure regarding assistance to be provided to the State Fire and Rescue Service and activities to be performed outside the power plant territory for elimination of emergency dangerousness or consequences

Power plant dispatcher shall meet the subunit of the State Fire and Rescue Service at the entrance to the power plant territory and shall wait for the fire-fighting and rescue operations manager (hereinafter Rescue service manager) arrival at the Power Plant's Control room as well as Power plant dispatcher shall stop the necessary equipment, disconnect the power source, and distribute the dielectric personal protective equipment (mobile earthing and dielectric gloves) to the subunits of the State Fire and Rescue Service.

Power plant dispatcher shall introduce the Rescue service manager with available operational information in place of incident and labour protection activities, instructs about fire fighting and rescue activities in the electrical facilities, and issues written permit for fire fighting and rescue activities.