

**Joint-stock company
„Latvenergo”**

**Plavinas HPP
ABRIDGED CIVIL
PROTECTION
PLAN**

Aizkraukle – 2020

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Introduction

JSC Latvenergo Plavinas 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 Plavinas HPP Civil protection plan has been agreed on October 5, 2019 and approved on October 6, 2020 by the State Fire and Rescue Service Zemgale 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 Plavinas 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
AN	Operational designation of hydrounit
ATZ	Anonymous phone call
AUL	Maximum water level in reservoir (73,44 m amsl) (MWL)
ĀS	Emergency situation
BV	Hazardous substances
CA	Civil protection
CAK	Civil protection commission
CAOK	JSC Latvenergo Civil protection organisation procedure
CAP	Civil protection activities
DD	Hydro power plant Dispatch department
DVKC	Safety management and control center of Safety department
HA	Hydrounit
HES	Hydr Power Plant (HPP)
HTB	Hydrotechnical structures
HTBD	Hydrotechnical structure department
IAL	Personal protective equipment
IK	Identification cards
IMP	Probable Maximum Flood
IRD	Equipment maintenance department
ITT	Information technology and telecommunication department
KK	Left bank
KKPP	Latvenergo group crisis management policy
KPK	JSC Latvenergo crisis management commission
KVK centrs	JSC Latvenergo crisis management control centre
LAS-2000,5	Latvian standard altitude system
LB	Downstream
LK	Right bank
LVĢMC	Latvian environment geology and meteorology center
NĪAF	Property management department
NUL	Normal water level in reservoir (72,14 m amsl) (NWL)
NMPD	State emergency medical service
NP	Oil products
PHES	Plavinas Hydr Power Plant (PHPP)
PSO	Transmission system operator (AS „Augstsprieguma tīkls”)
RAAD	HPP Relay protection and automation department
RID	HPP Department of electrical and mechanical equipment
RP	Radioactive pollution
RVP	Regional Environmental Service
SBP	Explosive object
TD	HPP Technical department
TN	Transformer
UH	Firefighting hydrant
VKC	Control center
vjl.	Above sea level
VUGD	State Fire and Rescue Service
ZS	National Guard
ZUL	Lowest water level in reservoir (69,14 m vjl.) (LWL)

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 Plavinas 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

Plavinas HPP location: Energetiku street 2, Aizkraukle, LV-5101, Latvia.

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

2.1. Geographic location

Administratively Plavinas HPP is located in Aizkraukles region, in the territory of Aizkraukle city, 1,5 km away from Aizkraukle city centre (see 2.1.picture).



2.1. picture. Plavinas HPP location

On the river Daugava right and left banks the power plant is accessible from the access roads that in distance of 7km to the North are connected with the road Rīga – Daugavpils (A6) and to the South with the road Rīga – Jēkabpils (P76).

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 in Plavinas HPP surroundings (in accordance to the data from Hydrometeorological Center Zilani) is from -6,6°C in February to +22,3°C in July. Absolute minimum air temperature with probability once per 50 years is -38,0°C and once per 10 years -33,4°C. Absolute maximum air temperature with probability once per 50 years is +34,40°C and once per 10 years +31,90°C.

Annual precipitation is 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) Plavinas HPP water flow rate is 12600 m³/s. River Daugava has characteristic wide range of variation in flow. During dry summer and winter seasons the water flow decreases to 100 – 150 m³/s, but during the flood the flow can increase up to 4000 – 8000 m³/s. Average annual flow is 600 m³/s.

3. Description of Object of increased danger and its operation

Plavinas 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.

Plavinas 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.

Plavinas HPP hydrotechnical structures consists of concrete and soil constructions.

Above the Plavinas HPP dam there is man-made reservoir.

Concrete structure is power plant building connected to the spillway and road tunnel passing under the spillway.

Plavinas HPP main structures are hydraulically flushed riverbed dam, right bank dam and left bank dam.

Reservoir's storage capacity is 509 million m³ at the normal water level in reservoir and 580 million m³ at the maximum water level. 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 from 7:00am to 7:00pm and from 7:00pm to 7:00am.

3.2. Technological processes and equipment

The main task of Plavinas 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.

Plavinas HPP water head is 40 m, and total installed capacity 907,6 MW.

Main equipment

For power generation 10 Units are used.

Ten stop logs and two lifting equipment are considered as mechanical equipment of hydrotechnical structures. Water flow capacity through the spillway is given in Annex 1.

Also two five block transformers are considered as main electrical equipment.

3.3. General description of technical systems and auxiliaries

3.3.1. Water supply

Plavinas HPP raw water (for Unit and transformer cooling) is supplied from PHPP reservoir by gravity flow.

Water for firefighting and potable systems is supplied from two water pipelines of Aizkraukle city. Water for external firefighting piping is loop type with diameter 200 mm, there are six Moscow type hydrants installed. On the tree type (branch type) piping with diameter 100 mm, on the left bank there is one Moscow type hydrant installed and on the right bank there are two Moscow type hydrants installed.

3.3.2. Wastewater system

Domestic wastewater is drained by twin stage sewage pump stations to the Aizkraukle city wastewater collection system and further to the city's wastewater treatment plant

The waste water from the floor in Power plant is discharged to the oil separator tanks on elevation 32,14 m.. After the oil has settled the water is filtered through biological treatment system and discharged downstream.

3.3.3. Power supply

Plavinas HPP main power supply is provided from 6/0,4 kV; 1000 kVA transformers TN6 and TN7, that are located in the power plant building on elevation 42,14 m un from AS „Sadales tīkls” North-east region sub-station No.4 20/6 kV distribution board 6kV cable lines.

For main consumers auxiliary power supply is provided:

- automatic transfer switching (further – ATS) with absence control from transformers TN9 and TN8, 750 kVA each, 13,8/0,4 kV. TN8 and TN9 in reserve, disconnected from 0,4 kV side and connected to the main transformers TN5 and TN2 on 13,8 kV side;
- after completion of switching the power supply is available (possible) from hydro units AN10 and AN9 (via TN9) and from AN3 and AN4 (via TN8) independently from position in the power system;

- diesel generator installed at the upstream cranes on elevation 75,14 m (SAB P-1431, total power – 860 kVA, with spare diesel of 1800 l) and the batteries serves as additional independent power sources;
- to restore voltage for 6 kV busbars in sub-station No.4 is possible also from 20 kV side. Activities for voltage restoration for 6 kV busbars in sub-station No.4 are managed by AS „Sadales tīkls” North-east dispatch center dispatcher and Transmission system operator (AS „Augstsprieguma tīkls”) personnel.

PHPP power supply outages are done by power plant operational personnel.

3.3.4. Heat supply

Working, technical and resting rooms in Plavinas 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.

Erection bay and battery room temperature is controlled by ventilation system air supply electric heaters.

3.3.5. Ventilation

Plavinas HPP administrative building and power plant rooms has balanced ventilation system with air supply and exhaust vents. All ventilation systems has summer and winter operation modes. The most part of ventilation systems are 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.

The battery rooms has individual balanced ventilation system with air supply and exhaust vents.

In office rooms the comfortable temperature and air humidity is controlled by automated ventilation 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

Dangerous equipment is equipment and complexes thereof, which as a result of inappropriate use and maintenance may endanger human life and health, the environment and material values and which during the use thereof are subject to the State supervision and control laid down in this Law and the checks laid down in laws and regulations. There are the following dangerous equipment in Plavinas HPP:

- Lifting equipment (elevators with lifting capacity 50kg and more and cranes with lifting capacity one ton or more);
- Pressure equipment.

Specialists responsible for supervision of technical condition and safe operation of dangerous equipment operation in AS Latvenergo are appointed by Order issued by AS „Latvenergo” generation technical director

3.5.2. Dangerous chemical substances

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

3.5.3. Plavinas HPP reservoir water storage and spillway capacity

Plavinas HPP is hydrotechnical structure with total water storage capacity in reservoir 509 MM m³ at normal water level (72,14 m amsl) (NWL) and water storage capacity in reservoir 509 MM m³ at maximum water level (73,44 m amsl) (NWL).

Maximum spillway capacity at normal water level in reservoir 72,14 m amsl (NWL) is 7870. Respectively at maximum water level in reservoir 73,44 m amsl MWL spillway capacity is 9570 m³/s. In addition power plant (ten turbines with total flow capacity at NWL 2680 m³/s and at MWL 030 m³/s) can be operated. If 10 Units are in operation and all stop logs are closed the maximum spillway and turbine capacity is 10550 m³/s at NWL and 12600 m³/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}.

Plavinas HPP internal risks consist of:

- failure of construction expansion joint and leak;
- problems operation with relief well system
- construction displacement and settlement;
- filtration through earth dams.

4. Risk assesment summary for objects of increased danger

In civil protection plan are included the following potential risks for Plavinas HPP:

- concrete, dam and soil resistivity issues;
- earthquake;
- flood and ice floating;
- storm and heavy rain;
- hard freeze and ice;
- radiation and chemical pollution;
- heavy vehicle accident in HPP road tunnel 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 rise above allowable level downstream;
- dam failure and dam crisis situation.

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

No objects of increased danger are located nearby PHPP (within ~1,5 km range). The closest public and commercial buildings in Aizkraukle city are located 1,2 km away from PHPP owned territories, at elevation 78,14 m amsl.

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

- to the North: right bank of the river Daugava, administration building on Tilta str.1 owned by AS Latvenergo, 20/6 kV distribution point owned by AS Sadales tīkls, 110 kV and 330 kV sub-stations owned by AS Augstsprieguma tīkls, and Aizkraukle city;
- to the North East: regional land (ex reinforced concrete factory);
- to the East: residential land;
- to the South East: PHPP reservoir;
- to the South: from dam PHPP reservoir;
- to the South West: gardening association „Ziedi”, regional and local lands adjacent to PHPP reservoir;
- to the West: left bank of the river Daugava, not maintained regional and local lands;
- to the North West: from dam PHPP downstream.

There is potential risk of wide downstream area flooding as a result of Plavinas HPP structure collapse, that may cause danger for human, materials and environment.

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 Plavinas 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 Plavinas HPP director.

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

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

Kegums HPP director is responsible for daily communication with State Fire and Rescue Service and other institutions, phone: (+371) 65110361, e-mail: kanceleja@latvenergo.lv

In case of accident or immediate threat Plavinas HPP dispatcher is responsible for cooperation with State Fire and Rescue Service and other institutions.

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 departments, 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 departments 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 departments the development, reassessment, 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 Plavinas 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 Plavinas 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 Plavinas 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 Municipality institutions.

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

- Plavinas HPP Director;
- Plavinas HPP Dispatch department manager;
- Plavinas HPP electrical and mechanical equipment department manager;
- Plavinas 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 Plavinas HPP dispatch service dispatcher's on duty:

- directly manages elimination of technological disruptions;
- liable for accuracy for elimination of technological disruption;
- after technological disruption occurred 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 PHPP control room;
- upon PHPP 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 PHPP 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 PHPP operator on duty:

- shall notify the PHPP dispatcher about all equipment operation disruptions;
- 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 PHPP 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.

PHPP 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 Plavinas HPP shall plan and organise employee training in civil protection management. 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 assistance.

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 Plavinas HPP.

PHPP 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 about 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 Plavinas HPP rooms and territory, system microphones with function keys for zone selection are located in HPP control room and security monitoring room.

Employee announcements 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 on the Administrative building roof which can be switched on manually from the control room.

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

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

Plavinas 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

Following 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 Plavinas HPP operational event log.

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

After receiving an information about emergency or emerging threat the PHPP 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 HPP technical management department 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 Plavinas HPP territory, here (specify position, name and surname) is speaking. There is an emergency situation in Plavinas 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

Plavinas 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 of an emergency 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 successfully 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;
- Plavinas HPP employees shall regularly have instructions (labor safety, fire safety, civil protection), as well as trainings;
- Plavinas HPP action plan for risk reduction has been developed for period from 2020 to 2025;
- Plavinas 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 programmes” have been developed;
- „Civil protection plan” has been developed;
- „Fire safety instruction for Plavinas hydro power plant” has been developed;
- „Plavinas HPP instruction for elimination of operation mode disturbances” has been developed.

Main tasks of hydrotechnical structures safety control system is structure condition monitoring and systematic measurements performed by control measurement system. Required activities for structure safety are determined and implemented based on monitoring, measurements and its analysis. All observations may be divided into 3 groups:

- Measurements done by automated monitoring system (AMS);
- Not-automated (manual measurements done by manual measuring devices);
- Visual monitoring.

Not-automated measurements and monitoring is done by hydrotechnical structure department (HTBD) personnel in accordance to the approved annual and monthly monitoring schedule. Additional measurements and monitoring can be done if necessary by including in the monthly operational plans approved by HTBD director.

Automated monitoring system (further AMS) collects measurements after every 10-30 minutes.

Each monitoring parameter has thresholds. By exceeding the allowable thresholds AMS registers warning signal.

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

In case of emergency the spilled oil from transformers is collected in the the oil sump tanks installed under transformers on elevation 32,14 m from where it is collected and handed over for waste management.

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.

People who are involved in elimination of emergency consequences shall use the personal protective equipment (protective clothing, footwear, rubber gloves).

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 danger

Plavinas HPP general goal is to prevent and reduce the possibility of emergency or damage due to emergency that can cause damage to environment and human health from the equipment used and hazardous chemical substances and mixtures.

To prevent chemical pollution or spread of emergency consequences the drainage system is installed in the power plant building, the spilled oil is collected into the oil sump tanks located on elevation 32,14 m from where it is collected and handed over for waste management.

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 warning system installed on the Plavinas HPP building roof - 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

Plavinas 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. Evacuation exits in the power plant buildings are shown by special evacuation signs. Personnel assembly points are at the Administrative building on Tilta street, in Plavinas HPP special areas on elevation 42,14 m and 75,14 m. 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 Plavinas HPP 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 Plavinas HPP employee(-s) is provided by emergency medical service personnel.

Decision about necessary (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 Plavinas 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 shall provide territory fencing and movement restrictions.

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

Plavinas HPP equipment fault mitigation methods, personnel actions in case of technological disturbances are stipulated by ,, Plavinas HPP instruction for elimination of

operational mode 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 "Technical maintenance of energy facilities" 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 dispatcher shall immediately notify the Transmission system operator (TSO) dispatcher 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 mitigation 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 environment 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 stream passing through Plavinas HPP).

In case of hydro technical structure, depending on the nature and extent of the damage damage as much as possible to reduce the water level in the reservoir and/or prevent the damaged area from water flow and impact of hydrostatic pressure, 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 two assembly points.

To prevent the threat to other persons after accident occurred (fire, oil spill) the restriction of people and vehicle movement in the threatened 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 Contractor 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

In case of emergency employees and contractors are notified by using the following alarm systems:

- Civil defence alarm system installed on power plant building roof and in machine hall elevation 42,14 m;
- Fire detection and alarm system;
- Public warning system;
- Telecommunication services (fixed network and mobile);
- Portable and stationary wireless audio systems.

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 PHPP 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 Plavinas HPP to ensure the room fire safety.

In all industrial premisses with increased fire risk are installed automatic fire fighting systems that in certain circumstances are operating in automatic mode as well as can be operated manually. System is controlled from control control room and managed by dispatch center.

of HPP buildings, assembly bay and administrative building office rooms are connected to the fire detection and alarm system.

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 Plavinas HPP 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 PHPP 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 Plavinas HPP.

After the emergency medical service has been called an emergency care 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 material reserve

For Plavinas 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-1 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 PHPP civil protection activities is possible with respective transportation department consent.

Reserve power supply to the main consumers will be provided from four 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

To discharge large amount of water there is a spillway on the upper part of the power plant Plavinas HPP spillway consists of 10 spans with vertical lift spillway gates that are operated by using two overhead cranes located on the upper part of reservoir. Spillway maximum discharge capacity at the normal water level in reservoir (NWL) is 7870 m³/s. Respectively at the maximum water level in reservoir (MWL) at 73,44 m, spillway discharge capacity is 9570 m³/s. In addition turbines can be operated with total discharge capacity at NWL is 2680 m³/s and at MWL– 3030 m³/s. Reservoir discharge rate is limited by the parameters defined in the design and in the Permit for the use of water resources.

In case if the power plant rooms are flooded the water will be pumped to the pumping stations DS1 and DS2 located in maintenance gallery and DS20 located in supporting structure on the right bank at elevation 22,64 m and is foreseen for water pumping from lower toe gallery and water ways, as well as there are also other drainage pump stations.

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 Palvinas 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 Plavinas 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 Plavinas HPP territory after receipt of emergency call in 75 % of cases emergency medical assistance is provided within 15 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.