Joint-stock company

Latvenergo

Kegums HPP ABRIDGED CIVIL PROTECTION PLAN

Kegums – 2020

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Introduction

JSC Latvenergo Kegums 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 Kegums HPP Civil protection plan has been agreed on February 27 2020 and approved on April 21, 2020 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 Kegums 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 (33,25 m amsl) (MWL)
ĀSI	outdoor power distribution facility
BV	Hazardous substances
CA	Civil protection
CAK	Civil protection commission
CSNg	Road traffic incident
DD	Dispatch department
DĢ	Diesel generator
DVKC	Safety management and control center of Safety department
ESI	Oil pressure system (OPU)
HA	Hidroagregāts
HES	Hydrounit
HES-1	Hydr Power Plant (HPP) part on Daugava left bank
HES-2	Hydr Power Plant (HPP) part on Daugava right bank
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
ĶHES	Kegums Hydr Power Plant (KHPP)
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 (32,15 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
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
VP	Control room
VUGD	State Fire and Rescue Service
ZUL	Lowest water level in reservoir (30,55 m amsl) (LWL)

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

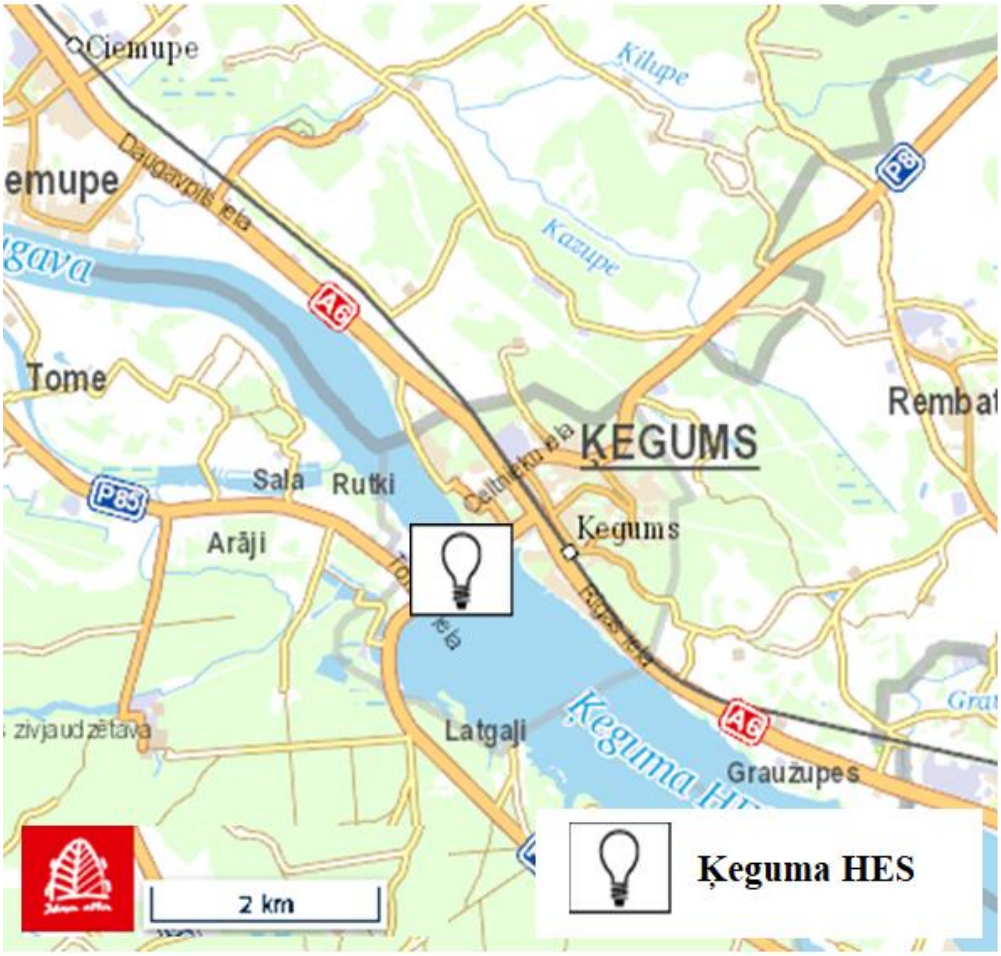
Name of Object of increased danger: Joint Stock company Latvenergo power plant Kegums HPP**,** Unified registration number No.40003032949. Legal address: Pulkveza Brieza street 12, Riga, LV-1230, Latvia, Phone: (+371) 67728222, fax: (+371) 67728880, e-mail: info@latvenergo.lv

Ķeguma HES location: Ķeguma prospekts 7/9, Ķegums, LV-1230, Latvia.

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

2.1. Geographic location

Administratively KHES is located Ķeguma region, in the territory of Kegums city teritorijā (see 2.1.picture).



2.1. picture Kegums HES location

On the river Daugava right bank the power plant is accessible from the access road that in 0,7km to the North is connected with the road A6 Riga – Daugavpils, on the left bank to the South KHPP territory is located on the border of the road RHPP – Jaunjelgava (P85).

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 -3,7oC in January to +17,4oC in July. Absolute minimum air temperature with probability once per 50years is -38,0oC and once per 10 years -33,4oC. Absolute maximum air temperature with probability once per 50years is +34,40oC and once per 10 years +31,90oC.

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) Kegums HPP water flow rate is 12650 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

Ķegums 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.

Kegums 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.

Kegums HPP dam consists of concrete and soil constructions. Above the Kegums HPP dam there is man-made reservoir

Main concrete construction is spillway dam with stilling, HPP-1 building is located on the right bank and HPP-2 building is located on the left bank, both has intake channel and draft tube, fish pass and road bridge.

In the water reservoir with storage capacity 157 million m^3 the Daugava river water is stored. The hydrotechnical structure serves for energy accumulation and flood control, besides that the water reservoir is used for resident recreational needs.

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. zDispatch department employees are working in 2 shifts: 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 Kegums HPP is the same as for other Daugava river 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.

Kegums HPP-1 and HPP-2 water head is 14 m, and total installed capacity since 2001 is 264 MW.

Kegums HPP reservoir with total storage capacity 157 MM m³ is specific hydroelectric energy battery with normal water level (NWL) in Kegums HPP reservoir is 32,15 m, maximum water level (MWL) – for water discharge during flood period – 833,25 m and the lowest water level (LWL) – 30,55 m.

Main equipment

For power generation 7 Units are used - 4 (HPP-1) and 3 (HPP-2). Water flow through each unit is from 145 m^3/s up to 607 m^3/s depending on the calculated head and power .

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

Also wo transformers are considered as main electrical equipment.

3.3. General description of technical systems and auxiliaries

3.3.1. Water supply

The raw water for Ķeguma HPP-1 and HPP-2 (for generator and other equipment cooling) is supplied from KHPP-1 2nd intake channel by gravity flow.

Water for external firefighting system in HPP territory is supplied from the city's external loop type firefighting piping with diameter 150 mm, in HPP-1 territory the piping is tree type (branch type) with diameter 150 mm, there are three Moscow type hydrants installed, in HPP-2 territory the piping is tree type (branch type) with diameter 150 mm, there are two Moscow type hydrants installed, In HPP-2 territory there is also loop type piping with diameter 150 mm, where two Moscow type hydrants No.2 and No.3 installed,

Upstream of HPP-1 on the right bank of the river Daugava the water to the fire trucks is supplied from the water source built specially for fire fighting purposes. Upstream of HPP-2 on the left bank of the river Daugava there is one water source and downstream there is another water source to the is supplied from the water source for fire trucks to be used for fire fighting purposes.

3.3.2. Wastewater system

Domestic wastewater is pumped from pumping station on elevation 22,05 m in stop log storage rack of Kegums HPP-2, then wastewater is pumped to the Kegums city wastewater treatment plant, responsible for wastewater treatment is local government company SIA „Ķeguma stars".

In KHPP rainwater drainage system is not foreseen.

The waste water contaminated with oil are discharged to the oil separator tanks. After the oil has settled the water is filtered and discharged downstream. The wastewater quality is controlled by KHPP and certified laboratory. HPP-1 drainage water after settlement is discharged downstream without filtration.

3.3.3. Power supply

In KHPP self consumption is provided from HPP-1 TN8, TN9 and HPP-2 TN1, TN2 three winding transformers 11/20/6 kV. 6 kV voltage.

HPP-1 and HPP-2 interconnected power storage sources will be used in case of self consumption loss, stationary diesel generator of HPP-1 and HPP-2.

KHPP power supply disconnection is done by operating personnel only.

3.3.4. Heat supply

Kegums HPP heat supply for industrial premises is provided by electrical air heaters, in administrative rooms – electrical heaters.

3.3.5. Ventilation

HPP buildings and administrative rooms has balanced ventilation system with air supply and exhaust vents. The most part of the ventilation system is automated.

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

Battery rooms has balanced ventilation system with air supply, exhaust vents and gas analyzer.

In office rooms the comfortable temperature is controlled by conditioning systems.

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 Kegums HPP:

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

Specialists responsible for supervision of correct dangerous equipment operation in AS Latvenergo are appointed by Order issued by AS „Latvenergo" generation technical director

3.5.2. Dangerous substances and quantity

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

3.5.3. Kegums HPP reservoir water storage and spillway capacity

Kegums HPP is hydrotechnical structure with total water storage capacity in reservoir 157 MM m³ at normal water level (32,15 m amsl) (NWL) and useful capacity 36,4 MM m³.

Spillway is foreseen for release of large amount of water from a dam downstream**.** Maximum spilway capacity at normal water level in reservoir 32,15 m amsl (NWL) is 7470. Respectively at maximum water level in reservoir 33,25 m amsl MWL spilway capacity is 11575 m^3/s. In addition powerplant can be operated. If all Units are in operation and all stop logs are closed the maximum spilway and turbine capacity is 9620 m^3/s at NWL and 13725 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].

Kegums HPP internal risks consist of:

- failure of construction expansion joint and leak;
- filtration through earth dams or overflow;
- 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 Kegums HPP:

- concrete, dam and soil resistivity issues;
- earthquake;
- flood and ice floating;
- storm and heavy rain;
- cable, transformer and power distribution facility icing;
- bioterrorism;
- radiation and chemical pollution;
- 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;
- concrete and earth construction deformations and collapse, flooded rooms;
- 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 KHPP (within ~1,5 km range).The closest public and commercial buildings in Kegums city are located 0,1 km away from KHPP owned territories.

As increased manmade hazard is considered the road overpass accross the river Daugava, the bridge (7,6 m wide and vehicle weight restriction up to 15 tons) that runs along the Kegums HPP-2 building approximately 20 m distance and along the HPP-1 building and may cause potential hazardous truck accident risk.

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

- to the North: residential house;
- to the Nort East: shop and cultural institution;
- to the East: park and residential house;
- to the South East: KHPP reservoir; bridge accorss the river Daugava;
- to the South: from dam KHPP reservoir;
- to the South West: road, meadows, farmsteads;
- to the West: road, meadows, farmsteads;
- to the North West: highway (A6), 110 kV sub-station (owned by AS „Augstsprieguma tīkls" (Transmission system operator).

There is potential risk of downstream area flooding as a result of Kegums HPP structure collapse, that may cause danger for human, materials and environment. Potential areas of the territories exposed to danger, water levels in the flooded territories at various scenarios are defined by modelling the water wave motion at the various potential collapse scenarios.

The river Daugava valley between Kegums HPP and Riga HPP Ikšķile and Ogre (30 – 40% of the territory) will be flooded partially, as well as in the territories of these cities the road A6 located on the river right bank and the railroad (Rīga – Daugavpils) will be flooded. On the left bank opposite of Ciemupe the local road P85 (Ķegums – Ķekava) will be flooded partially.

In case of dam failure will lead to downstream area flooding that may cause danger to 110825 people [1].

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

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 Kegums HPP director.

Kegums 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.

In case of accident or immediate threat Kegums HPP-1 or Kegums HPP-2 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 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 Kegums 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 Kegums 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 Kegums 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 Kegums HPP of AS Latvenergo are appointed by Order issued by AS „Latvenergo" General director the following responsible persons:

- Kegums HPP Director;
- Kegums HPP Dispatch department manager;
- Kegums HPP electrical and mechanical equipment department manager;
- Kegums 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 KHPP 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 KHPP control room;
- upon KHPP 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 KHPP 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 KHPP operator on duty:

- shall notify the KHPP 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 KHPP 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.

KHPP 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 Kegums 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 Kegums HPP (IU051).

KHPP 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 Kegums HPP-1 and KHPP-2 rooms and territory, system microphones with function keys for zone selection are located in Kegums HPP-1 and KHPP-2 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 on the Machine hall roof which can be switched on manually from Main control room.

Kegums 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).

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

KHPP 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

The 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 Kegums 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 HPP 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 with the Order issued by the HPP Technical dierector "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 Kegums HPP territory, here (*specify* position, name and surname) is speaking. There is an *emergency situation* in Kegums 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;

- Kegums HPP employees shall regularly have instructions (labor safety, fire safety, civil protection), as well as trainings;
- Kegums HPP action plan for risk reduction has been developed for period from 2019 to 2025;
- Kegums 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 Kegums hydro power plant" has been developed;
- „ Kegums HPP instruction for elimination of technological disturbances" has been developed.

In Kegums 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. In Kegums HPP monitoring system is automated and is located on the 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 operations personnel shall act in accordance to the „Kegums HPP instruction for elimination of 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

KHPP general goal is no 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 and oil treatment plant serves as preventive measures for spread of emergency consequences.

In case of emergency and possible threat operations personnel shall act in accordance to the „Kegums HPP instruction for elimination of 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 Kegums HPP warning system - civil defense siren (installed on the roof) 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

Kegums 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.

Emergency assembly point for personnel – HPP-1 parking and HPP-2 parking. 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 Kegums HPP employee(-s) first aid care shall be provided by power plant employees. After the emergency medical service has been called an emergency care to Kegums HPP 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 Kegums 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

Kegums HPP equipment fault mitigation methods, personnel actions in case of technological disturbances are stipulated by instruction. 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 Kegums 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 KHPP-1 are foreseen evacuation routes, in power plant territory there is 1 assembly point. KHPP-2 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

The Emergency Alert System is foreseen in emergency cases to send warning to Kegums HPP personnel, visitors, contractor's in due time and to guide people for safe evacuation from the power plant. For warning and to maintain communication the following alert systems are available in KHPP:

- siren (installed on the HPP-1 roof) – turned on manually;
- siren (installed HPP-2 machine hall) – turned on manually;
- fire detection and alarm system, that in case of fire will turn on sirens automatically and that are installed in Kegums HPP.

13.1.2. Fire protection and fire fighting systems and equipment

Fire detection and alarm system is installed in Kegums HPP to ensure the room fire safety. Automated fire fighting system is used to protect HPP-1 and HPP-2 power plants.

Automated fire fighting system and Kegums HPP left and right bank power plant security systems is connected to HPP-2 control panel located in security office.

13.1.3. Personal protective equipment and procedure for the use

Corresponding Personal protective equipment intended for use in the power plants is available for Kegums 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 KHPP 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 Kegums HPP.

After the emergency medical service has been called an emergency care to KHPP 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 are available at Kegums HPP.

For Kegums HPP civil protection system needs the necessary and available machinery and vehicles are located in Pļaviņas, Ķegums HPP territory (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 KHPP 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

Spillway is foreseen for release of large amount of water during the flood. Spillway is divided in 12 gates.

Spillway maximum discharge capacity at the normal water level in reservoir (NWL) 32,15 m amsl is 7470 m^3/s. Respectively at the maximum water level in reservoir 33,25 m amsl (MWL) spillway discharge capacity is 10455 m^3/s. In addition all 7 hydrounits maybe operated with total discharge capacity at NWL is 2150 m^3/s and at MWL– 2150 m^3/s. If all 7 Units are in operation and all stop logs are closed the maximum spilway and turbine capacity is 9620 m^3/s at NWL and 13725 m^3/s at MWL.

For water discharge drainage pump stations are foreseen.

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 Kegums 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 Kegums 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 Kegums 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.