

# ***Health and Safety System Management Plan***

## Table of Contents

### 1.0 Table of Contents

---

<b>2.0</b>	<b>INTRODUCTION .....</b>	<b>7</b>
<b>3.0</b>	<b>TERMS AND DEFINITIONS .....</b>	<b>8</b>
<b>4.1</b>	<b>Administration and Obligations .....</b>	<b>9</b>
4.1.1	Management Administration of Safety System.....	9
4.1.2	Management’s Representatives (Works Supervisors).....	9
4.1.3	Involvement of Employees .....	9
4.1.4	Commitment.....	10
<b>4.1.5</b>	<b>Employee’s Responsibilities.....</b>	<b>10</b>
<b>5.0</b>	<b>H&amp;S PLAN AIM .....</b>	<b>11</b>
5.1	Responsibility.....	11
5.2	Procedure .....	11
5.3	Working Environment Health and Safety Plan Provision .....	12
5.4	Drugs and Alcohol Policy Provisions.....	13
<b>6.0</b>	<b>PERSONNEL .....</b>	<b>14</b>
6.1	Personnel.....	14
6.2	Safety officer qualification .....	15
6.3	Equipment and machines.....	15
6.4	Personnel health insurance .....	16
6.5	Personnel transportation.....	19
6.6	Work periodicity .....	19
6.7	Staff catering .....	19
6.8	Staff accommodation.....	19
<b>7.0</b>	<b>SAFETY AND HEALTH MANAGEMENT SYSTEM.....</b>	<b>19</b>
7.1	Dariali Energy Organizational Chart.....	20
<b>8.0</b>	<b>FUNCTIONS, DUTIES AND RESPONSIBILITIES OF THE PERSONNEL .....</b>	<b>21</b>
8.1	General Requirements .....	21
8.2	Responsibilities of employees .....	21
8.2.1	Dariali Energy Technical Director Duties and Responsibilities .....	21
8.2.2	Chief Engineer/Shift Manager.....	22
8.3	Health, Safety and Environmental Manager.....	22
8.3.1	Duties and Responsibilities of All Employees .....	23
<b>9.0</b>	<b>RISK ASSESSMENT .....</b>	<b>24</b>
9.1	Hazard identification .....	25
9.1.1	Hazard identification procedure.....	25
9.1.2	Hazard definition.....	26
9.2	Requirements for Hazardous works.....	26
9.2.1	Working near/over water.....	26
9.2.2	Working at heights.....	27

9.3 Risk magnitude determination .....	28
9.3.1 Hazard probability determination.....	28
9.3.2 Determination of hazard severity .....	28
9.4 Risk magnitude determination result.....	30
9.4.1 Risk assessment table .....	31
9.5 Actions required for risk control .....	32
9.6 Selection of risk reduction procedures.....	32
9.7 Risk assessment documenting.....	33
<b>10.0 INCIDENT INVESTIGATION.....</b>	<b>34</b>
10.1 Incident investigation significance.....	34
10.2 Duties and Responsibilities .....	34
10.2.1 Chief engineer/Shift Manager .....	34
10.2.2 Safety manager .....	35
10.2.3 Person in charge at the scene .....	35
10.2.4 Incident investigation.....	35
10.3 Notification .....	36
10.4 Incident investigation process.....	36
10.4.1 Identification of incident severity and scale .....	36
10.4.2 Investigation method .....	36
10.4.2.1 Gathering the facts.....	37
10.4.2.2 Sequence of facts.....	37
10.4.2.3 Identification of factors contributing to an incident.....	37
10.4.3 Incident investigation result .....	38
10.5 Incident investigation documenting.....	39
<b>11.0 TRAINING .....</b>	<b>39</b>
11.1 Training planning and conduct.....	39
11.2 Training awareness, basic training.....	40
11.3 Training records .....	41
<b>12.0 PEOPLE BASED SAFETY PROGRAM .....</b>	<b>41</b>
<b>13.0 PERSONAL PROTECTIVE EQUIPMENT .....</b>	<b>42</b>
<b>14.0 SAFETY PROCEDURES OF HYDROELECTRIC POWER PLANT OPERATION.....</b>	<b>43</b>
14.1 Basic safety requirements.....	43
14.2 Turbine Operation and Maintenance Safety .....	45
14.2.1 Operational Safety Instruction .....	45
14.2.2 General Safety Instruction.....	45
14.2.3 Basic Safety Instruction.....	45
14.2.4 General duties of personnel.....	46
14.3 Work on/in electrical systems.....	47
14.4 Hydraulic, pneumatic.....	48
14.5 Lifting and transports of components.....	48
14.6 Gas, dust, steam, smoke.....	48
14.7 Special safety instructions – Francis Turbine.....	49
15.0 Generator.....	51

15.1 Operation Safety .....	51
15.2 Maintenance safety.....	52
16.0 Hydraulic Governor Operation and Maintenance.....	52
16.1 Maintenance safety.....	52
<b>17.0 TRANSPORT SAFETY REQUIREMENTS .....</b>	<b>53</b>
17.1 Basic requirements.....	53
17.2 Basic safety requirements for vehicle drivers.....	54
<b>18.0 PERSONNEL HEALTH ISSUES.....</b>	<b>56</b>
<b>19.0 ACTIONS IN CASE OF EMERGENCY .....</b>	<b>56</b>
19.1 Description of emergency .....	56
19.2 Incident control .....	57
19.3 Notification and callout procedure .....	59
19.4 Duties of the Incident Control team members.....	59
19.4.1 HSE manager .....	59
19.4.2 Technical Director.....	60
19.4.3 Head of Incident Investigation team.....	60
19.4.4 Formation of Incident Response Team.....	61
19.4.5 Chief Engineer.....	61
20.0 Person in charge at the incident site.....	62
21.0 Representatives of contractor-company .....	62
22.0 Visitors.....	62
23.0 Action in case of landslide alert .....	64
<b>23.1 Tunnel entrance and transformers building.....</b>	<b>64</b>
<b>23.2 Tunnel .....</b>	<b>64</b>
23.3 Landslide period.....	65
23.4 Staff's actions in the landslide alert .....	65
24.0 Fire safety .....	65
24.1 General requirements.....	65
24.2 Fire safety system.....	66
24.3 Communication chart and sequence in case of fire detection .....	66
24.4 Actions in case of fire detection.....	67
24.5 Evacuation in case of fire .....	68
24.6 Actions in case of injury of the staff .....	69
24.7 Equipment damage .....	70
24.8 Actions in case of attack to the facility or other security incident .....	70
2.4.8.2 Actions in case of traffic accident.....	71
24.8.3 Staff trainings and readiness for actions in case of emergency.....	71
24.8.4 Emergency communications.....	72
24.8.5 Contact information in case of emergency.....	72
<b>25.0 SAFETY AUDIT AND INSPECTIONS.....</b>	<b>73</b>
<b>26.0 REPORTING.....</b>	<b>74</b>
<b>27.0 ANNEXES .....</b>	<b>75</b>
27.1 Annex 1 Risk assessment document.....	77
27.2 Annex 2 Training Logs.....	79



<b>27.3 Annex 3 Training records.....</b>	<b>80</b>
<b>27.4 Annex 4 Dariali Energy training matrix .....</b>	<b>81</b>
<b>27.5 Annex 5 Evacuation egress system.....</b>	<b>82</b>



## 2.0 Introduction

---

Dariali hydroelectric power plant project provides for the operation of the hydroelectric power plant of 108 MW installed capacity built at an altitude of 1729 meters, in the Kazbegi region, the north-east of Georgia, on the Tergi River downstream. The hydroelectric power plant collects water flow from the river Tergi and through the penstock takes it to the main structure, which is located at an altitude of 1334 meters, 1.2 km from the Georgia-Russia border. The annual stable output of the hydroelectric power plant will 500 million kWh, of which about 70% of the energy will be generated in the summer months (May-October). It is foreseen that Dariali hydroelectric power plant will be connected to the national energy grid by Dariali 110 kV transmission line. After the start of the period of operation the expected period of amortization of the hydroelectric power plant will be 40 years.

The hydroelectric power plant consists of a 2-kilometer open canal and 5.6 km (5.5 m diameter) long penstock from which the water will be delivered to the powerhouse on the right bank of the river. The hydraulic unit consists of 3 vertical Pelton turbines and synchronous generator. The water flow pressure is 379.0 meters with 33 m<sup>3</sup>/s water flow. The hydroelectric power plant may operate independently as well as by synchronization with the national grid that will guarantee supply of both internal and systemic resources to the consumers.

The hydroelectric power plant is a complex, which consists of the following units:

1. The headwork water intake;
2. The penstock from the water intake to the sedimentation basin
3. Double-chamber periodic hydraulic wash basin;
4. The penstock from the sedimentation basin to the intake portal of the pressure tunnel;
5. Pressure diversion tunnel;
6. The powerhouse of hydroelectric power plant;
7. Service and cable tunnels;
8. The waterway;
9. The transformer substation;
10. The service and auxiliary facilities.

The Safety and Health Management Plan of Dariali Energy has been developed in order to create and establish a systematic safety and health approach and the incident-free culture of safety.

The Dariali Energy Safety and Health Management Plan applies to the operation of all components of the Dariali Energy hydroelectric power plant complex and all carried out works. Dariali Energy strictly ensures fulfillment of those requirements during performance of any necessary action, project, scheduled and emergency repairs or the work to be performed by the contractor.

The Dariali Energy Safety and Health Management Plan has been developed in compliance with the applicable safety laws of Georgia and also takes into account the health and safety requirements established by international organizations.

Safety and Health Management Plan will also apply to all contractors working on the site.

### 3.0 Terms and Definitions

---

**Audit** - a systematic and documented process for the obtaining and objective evaluation of the safety situation to determine whether the audit criteria are met.

**Audit program** – the program consisted of one or more audits scheduled for a specific time period, which is aimed at specific objective. The audit program includes all the necessary actions of the audit planning, organizing and implementation.

**Competence** - the ability to use theoretical knowledge of safety and health management plan in practice.

**Continuous improvement** – the process of review, update and improvement of safety and health management aiming the constant improvement of safety management.

**Contractor** – an organization or person that provides a service to the other organization in accordance with the pre-agreed details and terms.

**Document** - a paper that contains information relating to the safety and health management system.

**Worker** - an employee of the organization, or a person hired by the organization on the daily basis.

**Workers' Representative** - a person holding a non-managerial position, who:

- a) represents other workers in accordance with the requirements of the law, or the Collective Agreement; or
- b) has been selected by the workers for other reasons.

**Ergonomics** - the integrity of knowledge of social and technical sciences, which is used to assess the suitability of the work, systems, products and the environment to the people's physical and mental characteristics.

**Hazard** – a source of potential risk for an employee.

**Incident** - an event occurred in the process of the work which could lead to injury or illness, damage to the device and environmental impact (including events in which no one is injured, but could have been injured, which are defined as a “near-miss” or “close call”).

**Legal requirements** – the requirements of local (Georgian), regional/territorial and municipal laws and regulations, the collective agreements of the organization, which relate to the health and safety.

**Organization** - a company, enterprise, institution or association, or a part thereof, or their union, which has its own governance. An organization may be small one or a corporation, public or private institution.

**Other requirements** - other health and safety requirements to be complied with by the organization.

**Procedure** - the documented sequence of the processes, the performance of which is necessary, and its breach may be subjected to the administrative measures.

**Process** –the integrity of interrelated actions aimed to the required result.

**Records** - a document that confirms the results, or describes the actions performed.

**Risk** – the combination, product of the likelihood of occurrence of a dangerous event and the amount of the damage caused by this event.

**Safety and health management system** – a part of the management of the organization that manages the service, health and safety risks and their related activities.



**System** –the integrity of interrelated or interacting elements.

**Official parties** - managers (including supervisors), workers and their representatives.

## **4.0 General Requirements**

---

### **4.1 Administration and Obligations**

#### **4.1.1 Management Administration of Safety System**

The management of Dariali Energy provides for the management of the safety and health activities and takes responsibility for the execution of this plan. This responsibility includes:

- the introduction and active implementation of the health and safety system,;
- providing the adequate financial, human and organizational resources to plan the health and safety activities, their implementation, verification, review and amendments thereof;
- the determination of the employees' functions, division of responsibilities, identification of accountability and delegation of authority for the effective implementation of the safety and health;
- the identification and implementation of the safety and health policy and measurable goals;
- the review of the organization's safety and health plan in the scheduled time intervals;
- consultations with the workers and their representatives; and
- promotion of active involvement of the workers and contractors in the safety and health introduction and implementation.

#### **4.1.2 Management's Representatives (Works Supervisors)**

The Dariali Energy Management, subject to the company's business scale and size, will appoint one (or two) representative of the management who, among other responsibilities, will define the roles, responsibilities and authority to ensure the implementation and review of the safety and health plan with the aim to:

- implement effective processes to identify work-related hazards and risks, eliminate or minimize them and provide permanent control thereof;
- report to the management, workers and their representatives, how the safety and health plan requirements effect, discuss and find ways of improving.

#### **4.1.3 Involvement of Employees**

Involvement of the employees is the fundamental aspect of the safety and health plan requirements. The Dariali Energy workers and their representatives are provided with the opportunity, time and resources to participate in the assessment of the safety and health issues and to involve in the processes of creation of the safe working environment, safety issues implementation, training, evaluation and adjustment processes; also, the company will encourage the workers' involvement using the following mechanisms:

- Support of the workers' involvement through identifying and removing barriers to the involvement;
- Creation of the health and safety group in the organization, or selection of workers' representatives.
- Providing training of the workers and their representatives, consulting with them on all aspects of the safe working environment related to their activities;



- Encouragement of the workers actively involved in the safety activities in various forms.

#### **4.1.4 Commitment**

The Dariali Energy management ensures implementation of the safety and health management plan with full responsibility, commitment and readiness; it allocates necessary resources for creation of the health and safe environment. Dariali Energy creates a productive, safe and healthy working environment for employees, contractors, clients, customers, guests and visitors.

Our obligations are known to all employees, contractors and suppliers. These include:

- to create and implement the safety and health culture, which provides the absolute unacceptability of harm to employees in the working process;
- to timely evaluate the health, safety and environmental hazards for the new and existing working systems and equipment;
- to encourage the team-based problem-solving at all levels of the organization, in order to introduce the working practices that will continuously improve the safety and environmental standards and productivity;
- to timely notify and investigate incidents in order to identify their cause and in a timely and effective manner to prevent completely their recurrence and to introduce the preventive systems;
- to provide for the compliance with the legal requirements and industry standards;
- to provide the training of managers and workers in order to ensure due performance of the activities described in the safe work procedures;
- to provide to every employee, contractor and consumer the information about the health, safety and environmental issues, which are related to the operation of the power plant owned by Dariali Energy;
- to ensure the safety of work processes and to neutralize environmental impact;
- we continuously improve the safety and health management through setting new goals, measuring performance and regular review of progress on the way to achieving the set goals.

#### **4.1.5 Employee's Responsibilities**

Every employee of Dariali Energy is responsible to comply with the requirements of the safety and health management plan, which will give a significant effect on the safety and incident and damage prevention;

Our employees are involved in the safety and health management through training, they make their contribution to identify, assess and control hazards.

## 5.0 H&S Plan Aim

---

The objectives of the Dariali Energy Safety and Health Plan aim is to create a safe and healthy working conditions. We map out the steps that are necessary to create the conditions thereof and formulate for the Dariali Energy safety and health management plan.

### 5.1 Responsibility

#### Management

- adopts the Dariali Energy health and safety plan and all legislative requirements;
- requires that H&S plan be applied to certain operations;
- supports implementation H&S Plan in the course of all the actions/operations;
- “Provides resources to implement the health and safety management plan, including training”

#### Managers and supervisors

- review H&S plan on the initial stage of implementation;
- transmit to all employees H&S plan requirements at the safety -related meetings;
- ensure that H&S plan is timely and easily understood;
- Overseeing and enforcing implementation of the plan by all employees

#### All employees

- lend themselves to the requirements of the policy and support the implementation of the H&S Plan.

### 5.2 Procedure

Dariali Energy through consultations with the workers and their representatives will establish and maintain H&S Plan and will ensure that this plan:

- conforms to the Dariali Energy’s activity by its content, scale, safety and health hazards and risks;
- includes a commitment to comply with safety and health regulations and other legal requirements;
- includes a commitment to protect employees and to ensure continuous development;
- provides the framework for identification of safety and health goals and their consideration;
- is documented, implemented and maintained;
- is transmitted and informed to all employees;
- is available with or without the interested third parties;
- if necessary, will be discussed at the meetings devoted to the safety issues and is attached to all the plans, which are distributed to employees;
- is reviewed on the annual basis to determine whether it conforms to our company and whether the appropriate changes and corrections have been made.

### 5.3 Working Environment Health and Safety Plan Provision

Dariali Energy aims to become a leader in the local and international market. Dariali Energy is the best-quality-oriented company, which core values are the safety and health of our employees, prevention of accidents and environmental protection. We have the well estimated management of the quality control and performance, and the company's top priority is to be a leader in the field of the incident prevention and progressive environmental issues. To achieve these objectives, we take guidance from the following principles:

- All accidents, industrial diseases and environmental pollution incidents can be prevented;
- Relevant international and local laws and regulations are to be complied with;
- The employment is based on the creation of safe working conditions and environmental protection;
- Transparency and cooperation with the public and the government;
- Continuous improvement of the occupational health and safety management system.

The company's main objective is to study the world's best experience and comply with the own regulations.

The Dariali Energy management's main goals are:

- to create the appropriate attitudes and behaviors in the workplace;
- to provide a safe working environment to the employees;
- to reduce pollution with industrial waste, to neutralize its impact on the environment;
- to improve the performance through the training of the employees;
- to regularly conduct health, safety and environmental audits;
- to set every year the health, safety and environmental objectives and to take care of their implementation;
- to work in compliance with the best health, safety and environmental international practices;
- to minimize the number of the injuries and accidents;
- to introduce the positive environmental, health and safety culture;
- to increase the technical skills of each team subject to their new experience;
- to establish and maintain good relationships and effective communication with the public authorities, employees, private organizations or any third party involved in the project.

Dariali Energy is striving to achieve the best health and safety practices and standards. We believe that the compliance with the safety and health requirements is an integral part of the effective business management and therefore, we are going to continually improve our health, safety and environmental conditions.

We intend to regularly evaluate the performance of the health, safety and environmental conditions by our employees, contractors and suppliers. Dariali Energy attaches great importance to the compliance with the national and international regulations and standards, and aims to create a safe working environment for all employees, contractors, visitors, customers, suppliers, the local residents and the public.



We believe that all work-related accidents, incidents, bodily injuries and diseases can be prevented. No work is so important that it cannot be spent more time for the planning and implementation of safe performance.

We need cooperation with all employees, contractors, guests and visitors cooperation. We will encourage proposals that will help us to achieve the health and safety objectives and to create the safe working environment, with the zero number of accidents.

This policy applies to all operations and functions of Dariali Energy, including those situations, when the work is to be done outside of its territory.

Konstantine Ioseliani  
Chief Executive Officer

---

*This policy document is to be published and made available in all units of Dariali Energy under the responsibility of the safety supervisors.*

#### **5.4 Drugs and Alcohol Policy Provisions**

Dariali Energy declares zero tolerance to drug and alcohol use, and strict adherence to this requirement.

Any employee or contractor, who owns, sells, takes, is under the influence of drug or alcohol, or who will expose a measurable amount of alcohol or illegal drugs in blood or urine during the check (the quantity does not matter), is subject to disciplinary measures, shall leave the work area/office and the contract with him/her will be terminated.

Any employee or contractor who is present at the work during the work-related incident, or who uses the company's equipment shall undergo drug/alcohol check.

The check will take place also if the employee or contractor appears at work after 90 days or more absence from work. Drug testing will be carried out also when the management deems it appropriate.

We reserve the right to conduct random checks on alcohol and drug use of those employees and contractors, who perform security-related functions, for example, drive the company's vehicles, or perform field work. In addition, we reserve the right, without prior notice to employees and contractors, to conduct drug and alcohol checks. We will ask an employee or contractor to undergo the drug/alcohol test, if we have a reasonable suspicion that he or she has violated the ban on the abuse of alcohol and/or other substances, which becomes apparent in the appearance, behavior, speech or smell of the person in question during observation.

Contractors and employees, who are taking medications prescribed by a doctor, should warn their supervisor about the conditions and adverse effects of those medications. Some drugs may have adverse effects that can cause a risk or harm to other contractors.

The company will periodically carry out the sudden checks of the people who have entered and

left the workplace, which will be conducted by the company's authorized representative. The entrance of the company's or client's territory shall be regarded as the consent on the check of a person, cargo, transport, or any other check.

Drug/alcohol test refusal will be considered a positive test and will result in immediate cancellation of the contract, or other disciplinary measures. A contractor or an employee who declines the check will be required to sign the refusal document. If he or she refuses to sign this document, this will be recorded documentarily and stored in the personal file.

Drug and alcohol testing will be conducted at a credible and qualified medical clinic, by a medical staff, which has the authority to conduct these tests. All results will remain confidential.

If any employee or contractor notifies the management that another contractor or employee abuses alcohol or drugs, we will treat this prudently and confidentially. We will conduct the investigation and will make the decision on the drug or alcohol testing.

*This policy document is to be published and made available in all unions of Dariali Energy under the responsibility of the safety supervisors.*

## **6.0 Personnel**

---

Dariali Energy ensures the recruiting of the qualified management team with experienced professionals that will be a solid ground for the competent and efficient operation of all units of the hydroelectric power plant complex through performance of the related works.

The managing team will include the position of the health, safety and environmental manager, while its representative – the health, safety and environmental officer will be appointed at the power plant facilities and provide the supervision of the daily work process.

His/her duty is to ensure the awareness of the staff involved and visitors of the existing risks, hazards and possible consequences, to control the possibility of exposure and to provide the immediate response in case of necessity.

A necessary condition for the employees involved in the power plant operation is to pass the safety training before the start of the work and to confirm the willingness of adherence to the security requirements, and upon visiting the facility to become familiar with the safety instructions and to confirm performance thereof by his or her signature.

### **6.1 Personnel**

The hydroelectric power plant operation process involves the following positions of the personnel:

- Technical Director;
- 2 Chief Engineers<sup>1</sup>;
- 4 Senior Shift managers;
- 4 Senior Shift managers assistants;
- Senior hydraulic engineer;

---

<sup>1</sup> Chief Engineers also referred as Plant Managers

- 4 Headwork unit operators;
- 4 Sediment basin operators;
- 4 Turbine operator;
- Hydraulic equipment specialist;

## 6.2 Safety officer qualification

The person responsible for the fulfillment of the safety requirements will be selected according to his or her qualifications. A necessary condition is a higher technical education (preferably hydraulic or power engineer), at least 5 years of experience working in the safety system. This person shall be duly trained in the hydroelectric power plant operation and safety measures, as the safety manager. Given the location of the power plant complex, the safety officer shall have got at least a B category driving license.

## 6.3 Equipment and machines

The staff of the power plant, depending on the production needs works with the following equipment:

Powerhouse:

- turbine
- crane
- generators
- transformers
- Auxiliary electric/mechanic equipment;
- Pressurized vessels;

Headwork:

- Gates;
- Flowing water;
- trash racks;
- fish pass;
- Pipelines;
- Hoisting mechanisms

Auxiliarise

- Excavators;
- Service cars;
- Accomodation

During the installation all equipment was brand new and in good order examined by qualified experts. The inspection is verified by the issued certificates, and the staff training on the

equipment operation has taken place under the manufacturer instructions. The instructions provide fulfillment of the safety requirements, which will be complied with by the staff working with the equipment and controlled by the safety officer of the unit.

To improve the use of equipment and safety work with it, the individual risk assessment shall be performed, where the hazards, risk probability and severity of the consequences will be described. The exposure preventive measures will be determined and monitoring of their implementation will be performed. The equipment risk assessment will be performed by the health, safety and environmental manager.

#### **6.4 Personnel health insurance**

The total staff of Dariali Energy is insured by the insurance company “IC Group”, which provides the full medical care in case of injury of employees. The insurer’s medical provider is Stepantsminda medical center “GeoHospitals”. Evacuation of an injured to the hospital is described in the Chapter “First Aid”, which provides two options of evacuation: the evacuation by a vehicle of the enterprise or by the medical emergency transport of the provider clinic.

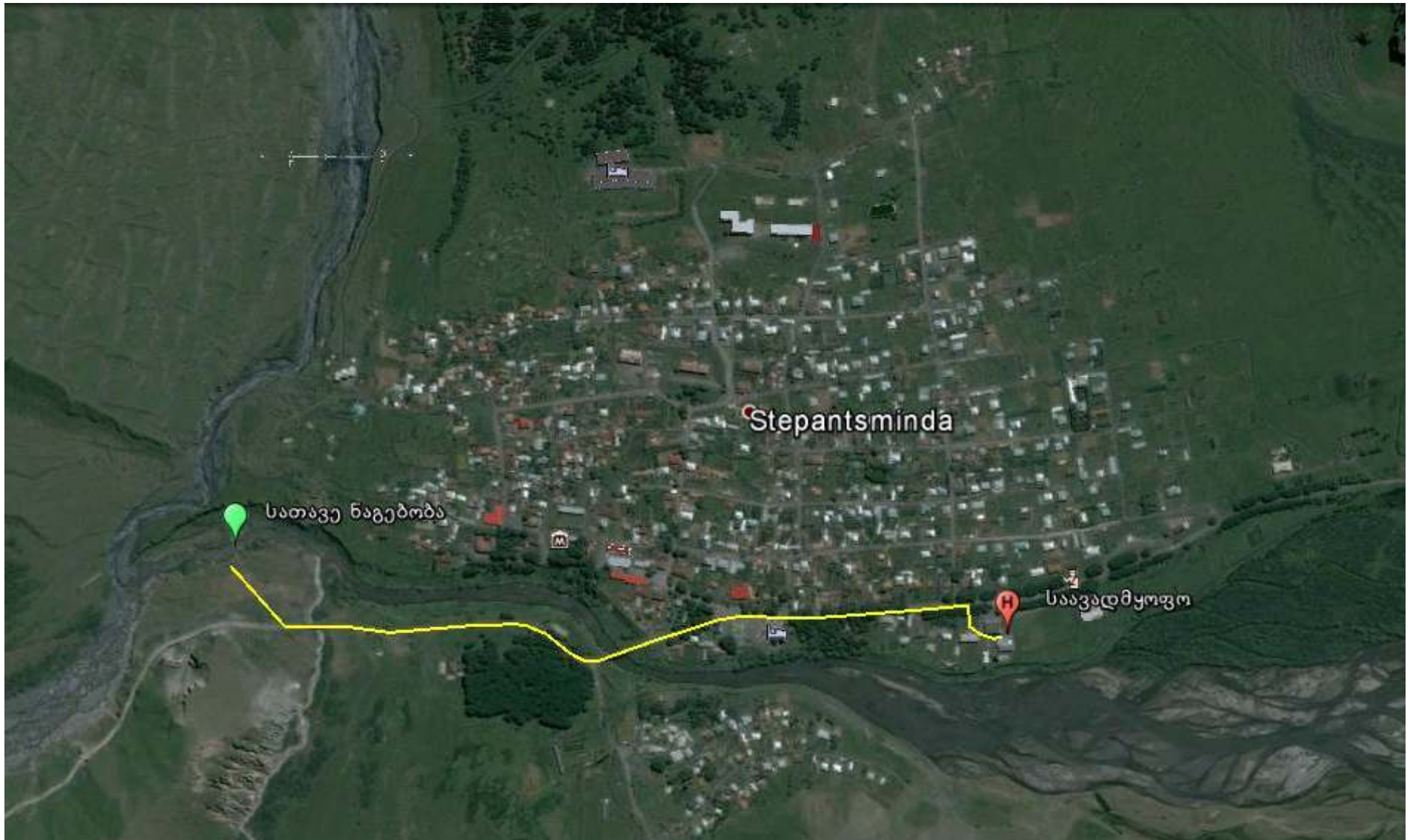
Stepantsminda clinic is located in the village Stepantsminda, that requires 5 and 20-25 minutes’ drive to transport the injured from the hydroelectric power plant area (from the water intake and powerhouse accordingly). The call shall be made to telephone number: (995 32) 250 52 22.

The distance from the water intake to the hospital is 1.5 km and from the tunnel entrance of the main building - 10.2 km;

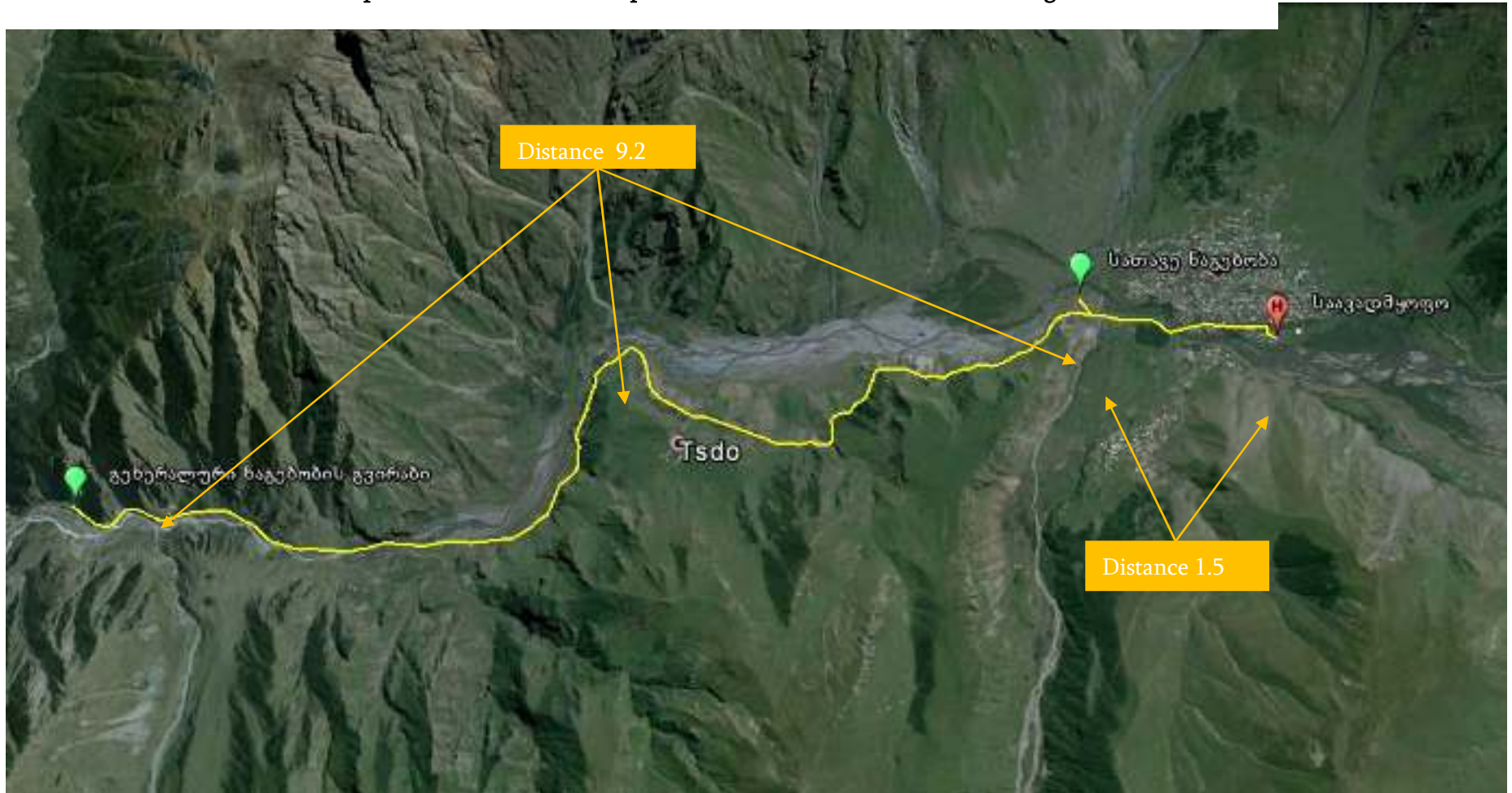
The staff engaged at the most important unit of the hydroelectric power plant complex will include one or two certified first aiders, who will be able to assess the quality of the injury, will decide on the necessity of evacuation of the insured under consultation with the unit manager and safety officer and will choose a transportation option.



**Location of Stepantsminda clinic “GeoHospitals” and the road from the water intake**



Location of Stepantsminda clinic “GeoHospitals” and the road from the main building



### **6.5 Personnel transportation**

The company will provide its personnel with transportation for internal transportation purposes. Two vehicles, adapted for local traffic conditions, will be purchase by the company.

### **6.6 Work periodicity**

Work periodicity of the Dariali HPP staff is in full compliance with Georgian legislation, detailed conditions of working time, leisure, vacation period and etc. are defined in the employment contracts.

### **6.7 Staff catering**

DE is implementing the staff catering conditions which will be in compliance with international practice;

### **6.8 Staff accommodation**

Staff accommodation for the workers who are not living in Kazbegi is provided in local hotel, locals are living in their houses and do not need accommodation from the company.

## **7.0 Safety and Health Management System**

---

The Dariali Energy top management has established the Integrated Management System, which details the duties, responsibilities and job description of the personnel engaged in the working process. The health and safety requirements are binding upon all personnel and specified in their duties and job descriptions.

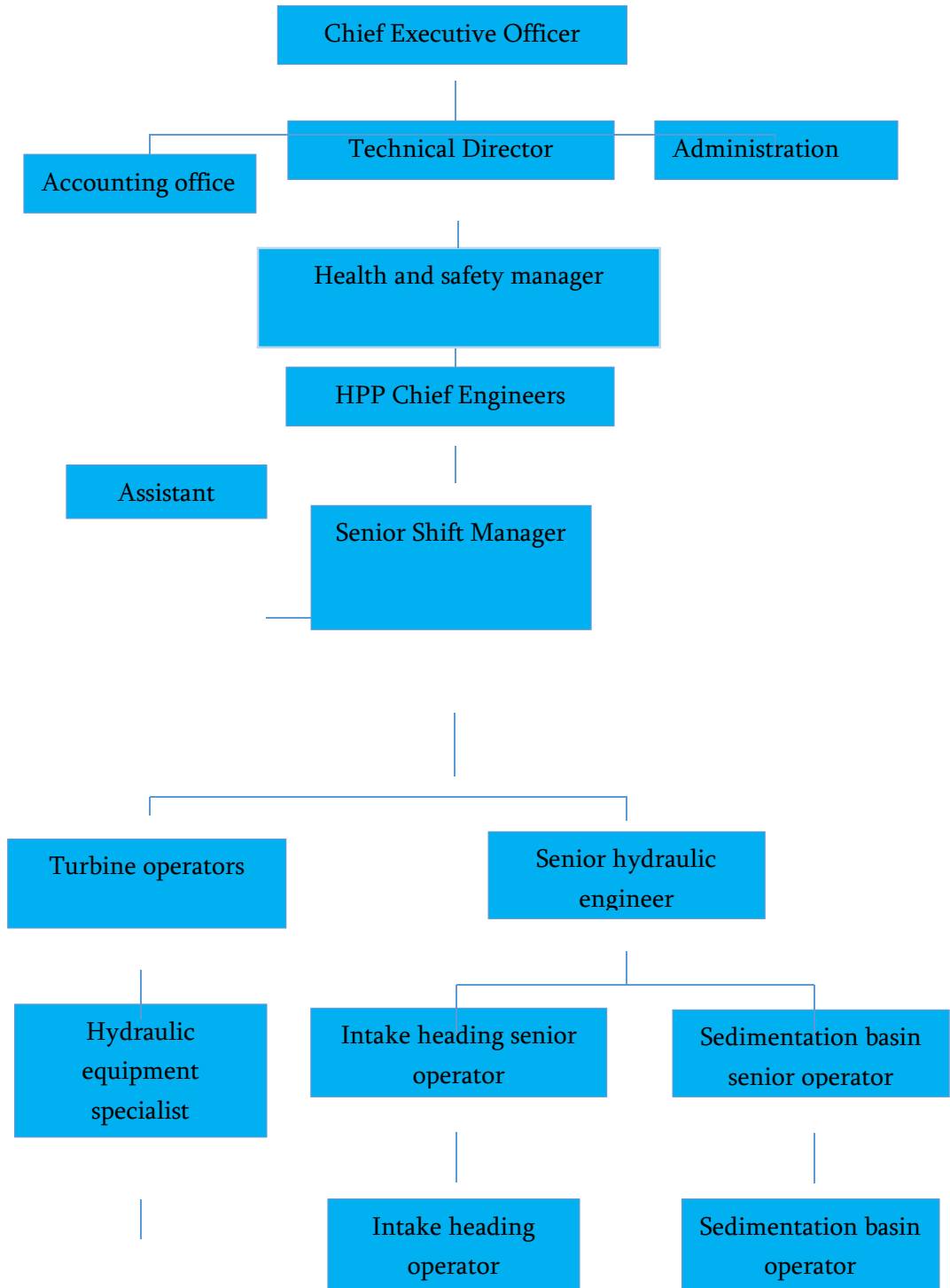
The position of a health and safety manager is defined as the head of the health and safety area. The position is attributed to the top management team, subordinated to the Technical Director while the Technical Director is directly responsible before the Chief Executive Officer.

The health and safety manager fully controls the Dariali Energy safety system, provides consultations on the safety issues to the Technical Director and reports to the Technical Director on the safety situation.

The safety manager is responsible for developing workplace safety instructions, introducing them to the staff and controlling performance of the requirements.

The Dariali Energy organizational chart is given below.

7.1 Dariali Energy Organizational Chart



## **8.0 Functions, Duties and Responsibilities of the Personnel**

---

### **8.1 General Requirements**

Dariali Energy's management attaches priority to the introduction of health and safety requirements and their implementation, that requires to define the duties and responsibilities in the area of health and safety of the employees engaged in the hydroelectric power plant operation.

The duties and responsibilities of all employees in the safety area will be developed and reflected in the employee's contract. The employees will learn about their duties and responsibilities before they start to work and will confirm performance by own signature.

Also, before the performance of the work, every employee will undergo training on safety issues to be ensured by the health and safety manager, while the safety and health briefing at the workplace will be conducted by a health and safety officer. All this will be documented and the employee's consent to perform the requirements will be confirmed by his or her signature.

The visitors and guests are required to fulfill health and safety requirements. The safety instructions will be developed for guests and visitors, describing their safe movement, actions in case of emergency and hazards of operation. All visitors and guests must comply with the established rules.

Entrance of drunken guests and visitors to the facilities is prohibited.

The responsibility for the performance of the safety requirements is undertaken by the health and safety manager, HPP Chief Engineer and the working team leader.

Each shift manager will be responsible for OHS. Also, this person will be trained in advanced first aid training and will be act as first aider, in case of injury.

### **8.2 Responsibilities of employees**

The duties and responsibilities of the employees engaged in the hydroelectric power plant operation are defined as follows:

#### **8.2.1 Dariali Energy Technical Director Duties and Responsibilities**

Technical Director has to fully support the management of the safety issues necessary for operation. His/her duties include:

- to declare full support for the health, safety and environmental policies, the planning and implementation thereof, to ensure involvement in its performance;
- to report with the pre-defined periodicity to the Dariali Energy Chief Executive Officer and the management about the state of safety at the facility;
- to ensure organization of timely agreement with the management and transportation of the inventory, equipment and instruments required for the safe operation, their supply to the facility and the personnel;
- to ensure the assistance of the safety manager of the unit in organization of the periodic trainings of the employees;
- to request from the heads of the production and the executors to comply with the safety requirements;
- to inspect with the pre-defined intervals (once a month) the safety of the unit together with the safety manager and to involve in the control of the measures for effective correction of detected violations;

- to take part in the monthly audit of the unit scheduled by the safety manager and involve in the control of the implementation of corrective measures;
- to oversee the work performed by the safety manager and request performance reports from him/her in a pre-defined periodicity (weekly, monthly);
- to require implementation of the requirements from the heads of production and work supervisors;
- to take part in the organization of measures in case of emergency.

### **8.2.2 Chief Engineer/Shift Manager**

Chief engineer together with the safety manager represents the safety and health head of the unit and is obliged to ensure the performance of safety requirements. It is his/her responsibility to ensure the following:

- together with the safety manager to control the work safety procedure and ensure its implementation;
- together with the safety manager implement and control the issue of the safe performance of works;
- attend safety briefing presented by safety manager and ensure implementation of discussed issues;
- organize and ensure his/her employees attendance at safety trainings;
- immediately inform about an incident to the direct superiors and safety staff;
- be involved in the incident investigation process and provide full support to the organizers of the investigation;
- provide permanent supervision of the existing machines, equipment and aggregates, to plan repair work and to take care of their maintenance;
- To take all responsibilities of the H&S manager, when H&S manager is not on the site;

In case emergency, if neither H&S manager nor Chief Engineer are not on the site, Shift manager takes all responsibilities of the H&S manager.

### **8.3 Health, Safety and Environmental Manager**

The main duty of the health and safety manager is to develop, introduce and control of the safety requirements, rules and procedures that should be implemented by operational staff. This position is dedicated on occupational health and safety, environmental compliance, waste management supervision..When the H&S manager is not on the site, Chief engineer will act as the H&S manager

The health and safety manager reports to Technical Director

It is his responsibility to ensure the following:

- develop and implement health and safety procedures, rules and requirements and to update periodically;
- ensure the performance monitoring together with the Chief engineers;
- take care of the constant improvement of the safety system;
- develop and implement the health and safety objectives and to ensure the assessment of their performance;
- provide the risk assessment in the workplace, to identify hazards and to plan the control/preventive actions;
- work out daily safety instructions, according to the specifics of the employees' positions.
- develop the staff training plan, under the agreement with the direct superior;

- provide the staff training, selecting the topics subject to the work specifics;
- maintain the safety database (see Chapter 24 - Reporting);
- carry out incident investigation, identifying their causes and to ensure development of the preventive measures in order to prevent a recurrence of the incident;
- conduct audits of the facilities, in presence of the Technical Director and heads of the production and to ensure the timely elimination of detected violations;
- attend working meetings and to ensure consideration of the current safety issues, to solve them in a timely and effective manner;
- provide daily and constant control of the ongoing work processes and to explain to the personnel the necessity of the safety requirements;
- to ensure development, introduction and control of the fire safety rules, and the introduction of control;
- to check the operating order of the safety equipment and to ensure in a timely manner organization of equipping the working process with the necessary devices;
- to provide first aid to the injured, to assess his or her condition and under the consultation with the management to organize the evacuation of the injured to the nearest hospital;
- to develop emergency action plan, giving parts to the staff and to conduct practical exercises for the effective implementation of evacuation if necessary;
- to provide the constant control of the scheduled repair work process and ensure compliance with the safety rules;
- to oversee the work performed by the contractor and ask for compliance with the safety rules;
- to provide reporting to Technical Director

### **8.3.1 Duties and Responsibilities of All Employees**

All employees have the right to work in a safe environment. Dariali Energy focuses on the creation of a safe environment for employees, development of the safe work rules and monitoring of the implementation of these rules.

**All employees are responsible to take care of their own and others' safety.**

All employees are required to:

- attend and participate in the health and safety trainings and get the maximum information about the health and safety requirements;
- Use PPE and follow safety requirements as specified in job descriptions, training, and instructions from supervisors and OHS manager, and be aware of disciplinary action for not using proper PPE and following proper safety requirements, up to and including termination of employment.
- appear at the office in the working and sober condition;
- become familiar with its workplace-related risks and threats identified;
- accurately follow the established safety rules and prevent their failure;
- before starting the work be provided with personal protective equipment; the work without the personal protective means is prohibited;
- not perform the work, which is not authorized by the chief engineer;
- promptly report to the immediate superior in case of mentioning any deviation in the operation of the devices and equipment (strange sound, excessive vibration, or other unwanted move);
- attend the safety instructions and take into account the instructions during the work;
- in case of an accident obey and carry out orders given by the superior;
- keep the workplace clean and do not allow its littering or occupying with unnecessary items;

- at the shift handover inform the alternate about the unexpected fact, failure or strange order of the devices and equipment and the threats thereof;
- in case of transfer to the other workplace, pass the safety briefing, study the new workplace risks and threats identified;
- take part in the investigation of the incident and provide full information to the organizers of the investigation;
- take part in the audit in his or her workplace and provide the information to the auditors matters required;

## 9.0 Risk Assessment

---

The risk assessment is the process of protection from the intensification of the threats during the work that aims identification, evaluation, assessment and control of the health and safety hazards for routine and non-routine work to be performed in the workplace.

The risk assessment is carried out by the Health and Safety Manager with the help of the chief engineer and under the approval of Technical Director. The process should be supported by keeping the document describing the potential hazards, the hazard scale with the characteristic of the effect of its activation, the existing control measures and the necessary actions to be implemented for preventive measures.

The risk assessment document shall be affixed with the signature of the appraiser, Chief engineers and Technical Director that will become a solid guarantee that the preventive measures described therein will be implemented.

To improve the efficiency of the risk assessment, it is mandatory to take into account the following successive stages:

- 1) identification of existing risk;
- 2) the risk analysis;
- 3) the procedure for risk reduction efforts;
- 4) improvement of the adopted procedure;
- 5) monitoring the effectiveness of the procedure.

The chart below illustrates the above provisions:





To evaluate the effectiveness, it is necessary to ensure the involvement of employees in the risk assessment and its management processes, with the aim to eliminate the risk of bodily injury, illness or damage to the property or to minimize the risk;

To accomplish this goal it is necessary to timely plan and implement the risk assessment as the instrument of achieving the constant improvement in our safety and health system. It is important to use a risk-management procedures when identifying the annual objectives of the safety and health care.

Risk assessment should be made individually for all units of the Dariali hydroelectric power plant complex. It is also necessary before production of the repair and installation works having the excess risk to assess the risk and provide for the risk control measures in the process of works.

## 9.1 Hazard identification

### 9.1.1 Hazard identification procedure

Dariali Energy health, safety and environmental manager performs basic evaluation of the hazards in the workplace. He/she identifies various works to be performed and the accompanying potential risks. The basic risk assessment includes but is not limited to the following issues:

- Scale of the job;
- Legal and other requirements;
- Incidents;
- Energy sources, pollutants and other environmental conditions, which can cause damage;

- Visit to the workspace.

### 9.1.2 Hazard definition

A hazard is anything that may cause damage to life, health or material goods. Workplace risk classification consists of six groups:

1. **F** - physical hazard factors, such as noise (constant and impulsive), air temperature, air circulation and local ventilation, draught, hot and cold items, outdoor work, general lighting, local lighting, vibration, ionizing radiation, ultraviolet radiation, laser radiation, infrared radiation, electromagnetic field;
2. **K** - chemical hazard factors such as hazardous and harmful substances, carcinogenic substances, allergens, combustible and explosive substances, fibers and dust, toxic and flammable gases, vapors, aerosol condensation and smoke;
3. **E** - ergonomic hazard factors such as cleanliness and order in the workplace, egress and evacuation routes, stairs and ramps, the height of the work surface, seats, screens and monitors, spinal position, arms, fingers and hands position, head and neck position, position of legs, permanent seating and standing position, working rhythm and break, weight lifting and cargo transport, tools, machinery and equipment, processing details, auxiliary items, working position change possibility.
4. **T** - accident risk factors such as slipping, falling, falling from a height, getting between objects (compression), electricity and static energy, closed space, falling in water, handling loads, lack of oxygen, dropping of things, lack of personal protective equipment, alcohol and drug use, defects of alarm and rescue equipment, defects of the first aid system,
5. **B** - biological risk factors, such as bacteria, viruses, fungi, syringes containing potentially infected blood, etc.
6. **H** - psychological risk factors, such as repetitive/monotonous (routine) work, working alone or night work, long vigilance, forced work rhythm, tension, speed, excessively strict requirements and objectives, absence of professional growth, job introduction and briefing, exact details of task and responsibility, overtime work, unreliable labor relations, the shortcomings of the organization or job management, unhealthy work environment, lack of information, endangered violence, unofficial communication forms (of any form of discrimination), lack of social support, restrictions on freedom (freedom of expression, participation etc.);

One of the objectives of identifying hazards is to identify the excessively dangerous jobs and dangerous zones, which should provide for implementation of the necessary measures and may consider the access control (e.g. the area in the vicinity of the turbine, cable tunnel, the transformer area, etc.);

Full identification of the hazard requires making of the list of hazard-generating sources in the workplace (where a hazard may generate), and then identifying the hazard by class.

## 9.2 Requirements for Hazardous works

### 9.2.1 Working near/over water

Any workplace over, on or near water presents a danger that persons might slip or fall into the water. Adverse weather is also a factor that can increase the danger, and work conditions can change quickly. Whether or not a person is injured by falling in the water, there is an immediate risk of drowning and/or being carried away by water currents.

There are a number of hazards that need to be considered when working near/over water. These include both safety and potential health issues. They may include:

- the risk of falling into water and drowning
- manual handling and lifting hazards
- electrical hazards
- trips, slips and falls
- the effect of extreme weather
- floating or submerged debris
- hypothermia
- sunburn and heat stress
- insect/bee stings.

An integral part of the risk assessment is to evaluate the necessary measures. This will involve taking into account the likelihood of an injury occurring and the severity of the injury suffered.

Necessary measures for control of safety measures are as follows:

- Training and supervision are an essential part of adequate control measures therefore all workers are trained for the rescue procedures and to ensure the first aid for the employees who works near/over water as well as for the visitors. Rescue procedures need to be practiced at regular intervals;
- Working with a partner or team when working around water. Preferably at least two people need to be in sight of each other at all times. Lone working is avoided to ensure there is always someone to raise the alarm.
- Life rings are available around of working position where a person could fall into the water;

### 9.2.2 Working at heights

**Working at height** means **work** in any place where, if precautions were not taken, a person could fall a distance liable to cause personal injury/death. Any person who works at heights must make sure work is properly planned, supervised and carried out. This includes using the right type of equipment for working at height. Risk assessment should be carried out before any work at height is undertaken. The assessment should highlight the measures that must be taken to ensure people are not at risk of falling from height.

DE HSE manager will use a five-step approach to risk assessment:

Step 1 Look for hazards associated with falls from height around the workplace. Where are people required to work at height? Do they carry out work from ladders, platforms, scaffolds, or unprotected or fragile roofs?

Step 2 Decide who might be harmed and how. Who comes into the workplace? Are they at risk? Are some groups more at risk than others?

Step 3 Consider the risks. Are there already measures in place to deal with the risks? Are regular inspections carried out?

Step 4 Record the findings;

Step 5 Regularly review the assessment. If any significant changes take place, make sure that precautions are still adequate to deal with the risks.

Emergency rescue plan will be in place to facilitate the rescue of trapped or fallen workers;

Training and instruction will be carried out periodically to minimize the risk from working at heights;

Head protector is required when working at heights;

All work equipment that is used to access work at height will be inspected by HSE.

### **9.3 Risk magnitude determination**

The determination of the risk magnitude requires assessment of two major components, such as the likelihood of threat and the severity of consequence in case of exposure. A risk assessment is the combination, the product of the likelihood of the risk occurrence and its consequences (the severity), for which it is necessary to:

- 1) determine the likelihood of threat : low, medium or high, and
- 2) determine the severity of consequence in case of threat occurrence: slight, minimal, significant, major, catastrophic.

#### **9.3.1 Hazard probability determination**

The hazard occurrence likelihood is a component of the risk assessment procedure of the Dariali Energy and it includes three-level hazard probability which is measured by the magnitude of hazard occurrence (activation).

Hazard probability is a measure of the degree of certainty that any threat will activate in certain periodicity which is determined as little, medium and high.

The little probability of hazard is when the situations and loads containing its hazard expose rarely, or for a short period of time;

The average probability of hazard is when the situations and loads containing the hazard expose permanently or for a time;

And

The high probability of hazard - when hazard-containing situations and loads are permanent.

#### **9.3.2 Determination of hazard severity**

To determine the severity of the hazard occurrence the Dariali Energy safety risk assessment system applies the five-level assessment, taking into account the following ratings:

- 1) Slight;
- 2) Minimal;
- 3) Significant;
- 4) Major;

## 5) Catastrophic

To improve the risk level assessment, the risk severity will be assessed for the injury to personnel and damage to property and environmental impact.

Personnel injury severity determination

**Slight** severity, when after small first-aid treatment the employee is able to resume work and is not required to be taken from the workplace to the medical facility or may be subjected to other treatment regimen bypassing the medical facility;

**Minimal** severity, when the employee needs a few days of medical assistance and treatment, no more than one working week and he or she requires the necessity of absence of the work, after which the employee will return to work and will be able to continue the operations;

**Significant** severity, when the employee requires more than a week period to treat the injury but not more than one month and requires the necessity of work absence, after which the employee will return to work and will be able to continue the operations;

**Major** severity, when the employee suffers occupational injury causing the incurable damage resulted to disability;

**Catastrophic** is a fatal accident.

### Determination of property and values damage severity

The property and value are the equipment and machinery owned by Dariali Energy and necessary for hydroelectric power plant operation. For determination of their severity the material evaluation is applied.

**Slight** is a damage when the loss does not exceed 500 GEL;

**Minimal** is a damage when the loss does not exceed 1000 GEL;

**Significant** is a damage, when the loss does not exceed 5000 GEL;

**Major** is a damage when the loss does not exceed 10000 GEL;

**Catastrophic** is a damage when the damage exceeds 10000 GEL;

### Determination of environmental impact severity

Dariali Energy considers the environmental impact as a very important issue. For effective assessment the environmental management plan will be developed, detailing the environmental impact possibilities and the necessary preventive and mitigation measures. The plan will also include the risk assessment process, where the same consideration would be given to environmental impact probability and impact severity, the necessary procedures will be developed and the management and staff responsibility will be detailed.

Depending on the priority of the environmental impact and sensitivity of the power plant location, the health and safety risk assessment procedure provides for determination of the level of severity caused by the environmental impact, the elimination of which will require human and financial resources.

In this case, the severity is evaluated by the financial resources and the property values and impact scale.

**Slight** severity of damage is when the loss does not exceed 500 GEL, the damage area does not exceed the workplace and is small.

**Minimal** severity of damage is when the loss does not exceed 1000 GEL, the damage area does not exceed the workplace and is small and controllable.

**Average** severity of damage is when the loss does not exceed 5000 GEL, the damage area slightly exceeds the workplace, is average and controllable.

**Major** severity of damage is when the loss does not exceed 10000 GEL, the damage area exceeds the workplace and is uncontrollable.

**Catastrophic** severity of damage is when the loss exceed 10000 GEL, the damage area exceeds the workplace and is uncontrollable.

#### **9.4 Risk magnitude determination result**

To get the final result of the risk magnitude, a combination of the exposure probability and grade of severity like the above is required (the magnitude obtained in the cross point), as presented in Table 8.4.1.

The figure produced as a result of the combination will ultimately determine the level of risk, according to which the preventive and control measures will be required.

9.4.1 Risk assessment table

	<b>Severity</b>				
	<b>Catastrophic</b>	<b>Major</b>	<b>Significant</b>	<b>Minimal</b>	<b>Slight</b>
<b>Injury of personnel</b>	Fatal event	Permanent disability, partial disability (PTD)	Lost-time incident involving absence from work over one day	No absence from work over one day, may involve first aid or off-site medical treatment	Near-miss, where there could have been an injury but due to some circumstance there was none
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Probability</b>	<b>Risk level</b>				
<b>Very likely</b> Permanent exposure	<b>15</b>	<b>14</b>	<b>13</b>	<b>9</b>	<b>4</b>
<b>Likely</b> Frequent exposure	<b>12</b>	<b>11</b>	<b>10</b>	<b>5</b>	<b>3</b>
<b>Unlikely</b> Rare exposure	<b>8</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>1</b>
<b>Result</b>	<b>13 - 15</b>	<b>9 - 12</b>	<b>6 - 8</b>	<b>2 - 5</b>	<b>1</b>
<b>Actions required</b>	<b>unacceptable risk</b> The work should be discontinued/stopped. Immediate action to reduce the risk. The work will cause great losses. The engineering decision-making and implementation is possible.	<b>Highly Significant risk</b> Risk reduction control measures shall be planned, priorities shall be assessed and the goals agreed. The work shall be performed only using the control measures.	<b>Significant risk</b> Operating procedures and performance monitoring. Risk reduction procedural requirements shall be developed. If necessary, additional measures must be adopted immediately.	<b>Slight risk</b> Operating procedures and performance monitoring. Risk reduction procedural requirements shall be developed.	<b>Negligible risk</b> Operating procedures and performance monitoring. Risk reduction using preventive measures.

## 9.5 Actions required for risk control

After obtaining the final risk result, it is necessary to perform adequate actions to provide the risk prevention and continuous control, so as to avoid the exposure and the incident caused by it.

**Negligible risk** does not require additional measures, performance of operating procedures and their monitoring. If necessary, the risk may be reduced by using preventive measures.

In case of **slight risk** the risk reduction and preventive measures should be developed and used in the performance of the operating procedures and monitoring thereof should be provided.

In case of **acceptable risk** it is necessary to develop the preventive measures and use them during the performance of the operating procedures and to provide permanent monitoring and if necessary to adopt additional measures.

**Significant risk** requires performance of work using the hazard prevention measures, which will describe the priority issues and constantly monitor the performance; the risk assessment procedures shall be performed by the work executor. .

In case of **unacceptable risk**, first of all the immediate action to reduce the risk shall be taken in order not to cause a large loss. It also may be necessary to make an engineering decision and perform the risk reduction at the workplace. After the reduction of risk, the risks should be assessed again, and then a decision will be made on work performance.

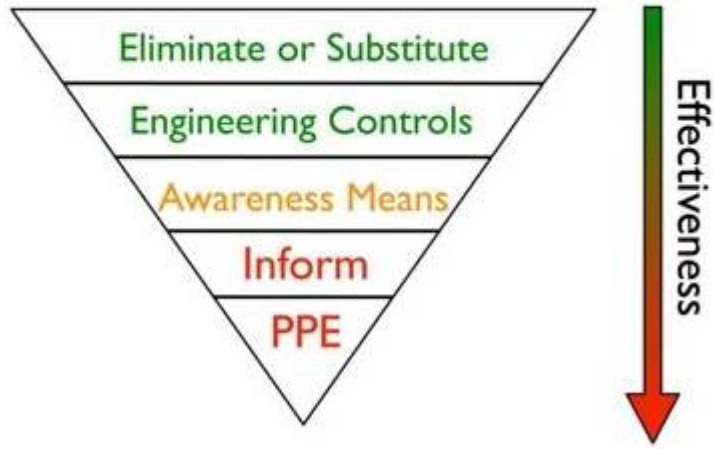
## 9.6 Selection of risk reduction procedures

The risk reduction procedure must be selected by the safety manager, chief engineer and the employee involved in the work process. To develop the risk reduction and preventive measures the five-stage hierarchical process should be used:

1. **Risk elimination** - means fully neutralizing of hazard and absence of the possibility of occurrence of caused incident. "Elimination" means that the risk is reduced to zero and there is no possibility of its emergence. Elimination is the ideal result of the risk assessment, which must also be permanent and not contain any hazard exposure in course of the work, which may require additional control measures.
2. **Risk substitution** - means substitution of a current hazard with a smaller hazard. Risk elimination also incorporates in the process of risk substitution with a lower hazard.
3. **Engineering controls** - is seen as a natural remedy to reduce the hazard that includes the structural changes in the work environment or process in order to create a barrier and to eliminate a direct link between the hazards exposures. The ventilation system is a good example of separation of the hazard from the dust, steam and smoke and operators. The priority should be given to collective protection.
4. **Administrative controls** - means to reduce or eliminate the risk by developing procedures and instructions. The performance procedure and safety requirements should be set out in the document, detailing the control measures and should be informed to all employees ensure their implementation;
5. **Personal protective equipment** - should be used to the end, after consideration of the first four stages. PPE effectiveness depends on the proper selection and use.



# Hierarchy of Controls



## 9.7 Risk assessment documenting

The risk assessment documenting is the necessity (see the Annex hereto). The document must be signed by the risk assessor, and agreed and signed by Technical Director

Risk assessment document should describe:

1. The scope of the work, with the sequence of its development stages;
2. The required actions;
3. The list of hazards within the performance;
4. The effect in case of exposure of a hazard. ;
5. The control measures;
6. The initial risk assessment defining their level;
7. The control and prevention measures;
8. The final risk assessment defining their level;
9. The person responsible for control;
10. Confirmation or denial of the lowest risk level.

## 10.0 Incident Investigation

---

### 10.1 Incident investigation significance

Dariali Energy's necessity of incident investigation underlies identification of the incident causes and development of recurrence preventive measures.

The incident investigation process should be used during the operation of the hydroelectric power plant for the detection of the following incidents:

- the need for first aid;
- the need for medical interference;
- occupational trauma-induced absences;
- material damage;
- fire;
- traffic accident;
- hazardous substance spillage;
- environmental damage;
- "near-miss".

All the circumstances that led to the injury of the working staff or other personnel, the equipment damage and environmental impact should be reported to the immediate superior and the safety manager.

The safety manager, together with the chief of the worksite and the working staff will investigate the incident in order to determine the causal factor.

An incident caused by a contractor is subject to examination. If the contractor uses its own procedure of incident investigation, it shall involve the responsible persons of Dariali Energy in the incident investigation and inform the results to the Dariali Energy management (the safety manager, a chief of the working area, Technical Director) and in case such procedure is not available, the contractor shall use the Dariali Energy incident investigation procedure under the supervision of its responsible persons.

Definition:

**Incident** - work-related event(s) in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred.

A **near-miss** is an incident where no injury or illness occurs.

### 10.2 Duties and Responsibilities

#### 10.2.1 Chief engineer/Shift Manager

In case of occurrence of an incident the facility manager shall:

- evaluate the extent of damage or loss arising from the incident and report to the Technical Director;
- establish an incident investigation team and get involved in the incident investigation process;
- ensure the cooperation of the subordinate staff with the incident investigation team;
- inform about the result obtained from the incident investigation – the causal factor, to the senior officials

- together with the safety managers and senior officials determine the preventive measure against recurrence and ensure its implementation and performance monitoring;

### **10.2.2 Safety manager**

The safety manager shall:

- upon the receipt of incident notification appear in the scene and assess the severity of the consequence occurred;
- immediately start and fulfill the incident investigation, in collaboration with the workplace staff and the site chief;
- determine the incident causal factors and assess the grade of recurrence;
- together with the worksite officials determine preventive measures to protect against a recurrence;
- inform preventive measures to the staff, if necessary, through the training;
- provide the continuous monitoring to control the performance of preventive measures in the workplace;
- periodically assess the effectiveness of preventive measures and in case of detection of defects, ensure their improvement.

### **10.2.3 Person in charge at the scene**

A person in charge at the scene is a person who: has detected the incident precondition; has witnessed the development of the incident; has discovered technical problems; has been in the vicinity of the incident place or has been the cause of the development of the incident.

The person in charge at the scene (if physically able) shall:

- assess the situation and the hazard thereof in case others could be injured or otherwise involved;
- immediately notify the person in charge, If the person in charge is not the shift supervisor, immediately notify the shift supervisor". Then, the shift supervisor will give first aid if needed and notify he safety manager and engineer
- warn all employees and take safety measures;
- cooperate with the incident investigation team and provide the necessary information;
- take part in the evacuation of personnel;
- comply with the superior's instructions;
- after completion of the incident take part in the incident investigation in order to determine the causal factors.

### **10.2.4 Incident investigation**

In case of the incidents occurrence, firstly the incident will be addressed. When the danger is over and the injured workers will be evacuated, the incident will be investigated. The formation of Incident investigation team and gathering facts will be in accordance section 9.4

The team operates in a coordinated manner and shares the functions for implementation of the measures to identify the incident causal factor. For example, the chief engineer and technical specialists investigate the initial and resulted condition of the device, in order to determine the damage factor; the safety manager interrogates the employees to study the conditions of the incident and to detect the violations of safety requirements from the side of the staff, resulting in the incident development description with necessary details.

The incident investigation team will use the video monitoring (surveillance) records available in the place, which will be used as evidence. The team will prepare a written report for all incidents, including near misses.

### **10.3 Notification**

The immediate notification of the incident and near-miss is the necessity. The notification shall be made for the staff that works in the vicinity of the incident, the direct superior and safety manager in case of a large-scale incident. When the situation is considered as an emergency, the process described in Section 18.0 must be performed. Failure to notify about the incident or “near-miss” can be considered as a ground for applying administrative measures.

The notification must include the following data:

- Description of the incident (fire, explosion, personal injury, spills and so on);
- specified place and time of the incident occurrence;
- the possibility of complication of the situation and its scope;
- in case of injury of the employee, description of injury;
- the person in charge for the incident and contact details.

### **10.4 Incident investigation process**

#### **10.4.1 Identification of incident severity and scale**

To determine the scale of an incident Dariali Energy uses a four-step system of evaluation: minor, average, major and extreme.

1. Extreme: death or serious injury (broken bone, long-term or permanent disability)
2. Major: medical attention and over one day of work absence, or more than one person involved in minor incident
3. Average: first aid or medical treatment but absence from work less than one day
4. Minor: minor on-site first aid, no absence from work
5. Near-miss: no injury even though serious threat of injury occurred

#### **10.4.2 Investigation method**

Before investigating the incident, it is necessary to provide the aid to an employee affected (if any) and, if necessary, take him/her to the hospital, and in case of a threat from the technical device to neutralize the threat. .

The incident investigation should be made in the following sequence:

1. Gathering the facts;
2. Sequence of events;
3. Identification of factors contributing to an incident;
4. Reporting.

#### **10.4.2.1 Gathering the facts**

HSE Manager assigns the incident investigation team and proposes the plan of team formation to the Technical Director, plan will include the information of team members. Technical Director assigns the chairman of the investigation team. For the purposes of gathering the facts, HSE manager leads the respective interviews. Facts must be collected through the interview of the employees working at the site. The interview should be carried out in a collegial and respectful environment. The employees must be informed of the interrogation and the reason of interview in advance and shall be informed that the purpose of this is only to identify the causal factor of incident but not to punish somebody, even if the human factor has been detected.

It is necessary to timely conduct the interview as long as the employees accurately remember the circumstances of the incident and at the same time, as long as the staff who witnessed the incident are able to discuss the incident and to agree on the desired factor.

Preferably the interview shall be conducted individually, so that the answers or remarks of several people to the asked question do not confuse the employee and he or she will not fix the other's opinion instead of the own one.

Also, it is desirable to carry out the interview by two members of the incident investigation team from which one will ask questions, and the other will be able to record questions and answers. The respondent has the right to request verification of the records and to sign it as approval.

The questions have to be precise and concise, and should be related to the incident facts and in case of verification of a vague answer, the question should be repeated later, after answers to other questions.

It is necessary to maintain the situation at the scene, to describe the sequence of events.

Members of the incident investigation team review the case on the scene where the incident took place, final decision on the case is upon the chairman of the investigation team.

#### **10.4.2.2 Sequence of facts**

For the incident investigation progress, it is necessary to establish the chronological order of the incident development facts and to focus efforts on explanation of the uncertain facts (if any).

In order to determine the exact sequence of the incident development, it may be required to summarize the results of interview and answers of several employees.

In case of recording the incident by the video surveillance, the priority will be given to the footage of incident and the interview results will be compared with the records.

The chronological order of the facts is the main way to restore the incident with the utmost precision.

#### **10.4.2.3 Identification of factors contributing to an incident**

3 root factors are defined as the factors contributing to an incident:

1. Human factor;
2. Technical equipment factor;
3. Natural phenomenon (earthquake, landslide, etc.).

When establishing the human factor it is desirable to investigate its root factors: personal and systemic.

The personal factors are the employee's physical and mental condition, which may be due to the following reasons:

- tiredness;
- stressful situation;
- routine work;
- poor attention;
- lack of motivation;
- lack of knowledge of system requirements;
- lack of experience;
- ineffective analysis of the knowledge gained through learning and training;
- failure to comply with the existing procedures, consciously or unconsciously;
- physical condition (defects of vision, hearing, and manifestations of other diseases)

The systemic factors are:

- lack of teaching and training;
- inadequate risk assessments;
- lack of supervision from the side of the management;
- inadequacy of performance procedures and safety requirements;
- less communication of employees.

Technical device factors are:

- factory defect;

The natural phenomena are an earthquake, flood, hurricane and other acts of God.

#### **10.4.3 Incident investigation result**

Incident investigation result is the finding, the determination of the severity of the incident and development of the preventive measures against recurrence.

Finding – the factor contributing to an incident defining the root results.

When detecting the human factor in case the root cause is the personal factor, it becomes necessary to select the condition protecting against recurrence in consideration of the information received as a result of the interview with that person. The recurrence protection measure will be the training of this person and teaching-training course repetition.

When detecting a systemic factor, it is necessary to develop the existing working and safety procedures to detect the current flaw. At the same time the necessity is to update the risk assessment, improve communication with the staff and provide continuous monitoring of the works.

To prevent the technical factor, the technical device should be operated in a test mode, using the preventive measures determined by the risk assessment.

When detecting natural phenomena, the emergency procedure described in Section 18 shall be used.

## 10.5 Incident investigation documenting

Incident investigation should be documented. The documented incident report must include: a detailed description of the incident, the incident causes and list of corrective action. The safety manager provides incident reporting for the Technical Director who reports to the Chief Executive Officer.

The archiving of all incident investigation documents is the necessity for incident statistics, where it is important to determine the frequency of casual factors and to study comprehensively the effectiveness of preventive measures.

It is also required to notify Lenders immediately if an serious incidents and/or fatalities occurs, then follow up with results of the investigation, including actions taken to prevent re-occurrence.

## 11.0 Training

---

### 11.1 Training planning and conduct

Teaching and training of health and safety standards, rules and requirements is regarded as one of the main means to achieve the goal determined by the Dariali Energy safety policy - to create the optimal conditions for safe activities of the staff.

The HSE management organizes trainings for the staff, which will be conducted by qualified and experienced specialists. In turn, all employees will be required to attend trainings and to analyze the obtained knowledge, innovation and teaching.

To achieve the effective teaching and training results the health and safety manager shall prepare the training program/plan, which will set the list of topics for training, according to the requirements of the staff work safety issues. It shall also describe the training implementation schedule, scope, venue for training and necessary equipment. The program should be agreed with the Technical Director and Chief engineers.

The conduct of training is organized by the health and safety manager with the support of the Technical Director while the duty of the Chief engineers will be to provide attendance of the training courses by the subordinate employees.

In order to ensure the required level of training in the specific employment field, HSE Manager has performed the analysis of training needs and has designed the training program in kind of a matrix (see Annex 3).

All employees must attend the safety training course according to the matrix, before starting the work, while the health and safety manager is responsible to register and record the trainings and to ensure that no employees will be allowed to the work before the attendance of the training courses. All instructions are conducted prior to:

- Starting of work;
- Using of any device;

Training time/manner will differ considering specifications of each worker's job. The training includes both, the specific training (in accordance to the job position) and general training for all employees. All workers will receive the trainings in the manner described in present clause. For the new employees, 1 month trainig will be conducted after that respective exam will be held. HSE manager will determine the employee with best exam results. For the employee whose results will be below satisfactory, will continue training. Information on exam, list of attendants, final results and other details will be described in HSE manager exam journals.

The main goal of the teaching and training is to make the Dariali Energy staff aware of the company's safety requirements and the system. At the same time, the employee is required to attend a basic safety training in the workplace, which will be conducted by the health and safety manager or Chief engineers.

For Chief engineers and working team leaders additional trainings will be conducted, which will cover the team leader's functions and workplace risk assessment.

Depending on the operating specifics of the Dariali Energy, the basic safety training of the personnel shall include the following topics:

1. The basic health and safety requirements;
2. Environmental requirements;
3. The actions in emergency situations;
4. Fire safety requirements;
5. Electrical safety requirements;
6. The safety requirements for the operation of machines and equipment;
7. Working at heights;
8. Small size cargo lifting rules;
9. Hoisting (crane) safety requirements;
10. Transport safety requirements.
- 11 Evacuation routes and rules

Additional training for the management shall include:

1. Health and safety management and significance;
2. Incident management and investigation;
3. Risk assessment and risk analysis;

Additional specific programs should be conducted for the producers of extra high hazard works such as electric and gas welding works, scheduled or emergency repair of the electricity system, the high voltages jobs, etc. The high hazard work is determined by the health and safety manager and Chief engineers.

The basic safety training should be provided to any visitor and guests entering the facility and shall describe the basic requirements, bans, requirements of the use of personal protective equipment, emergency actions and fire exits. The visitors shall be registered in the visitors' log.

The main equipment and machinery required for the hydroelectric power plant operation should be operated by the skilled professionals who will obtain the certificate of training in operation with this equipment. The training should be provided by the manufacturer, according to its requirements and safety rules. Upon completion of the installation of the power plant equipment Dariali Energy management should ensure the conduct of the training and issue of the confirming certificates.

## **11.2 Training awareness, basic training**

Given the teaching/training priority importance, Dariali Energy will ensure the full awareness of the training content for the staff, which is an important factor in determining the competence of personnel and training effectiveness.

To evaluate effectiveness of the training, the testing method will be used, polls will check the completed training topics.



The main essence of trainings, basic trainings is to enable the employees to independently assess hazardous and dangerous operations and by informing the safety manager and the superior to take charge of the threat neutralizing.

The Dariali Energy Management is aware of the great importance of the employees' involvement in the security system management efficiency and ensures that in case of occurrence of an incident due to a human factor, an administrative punishment will not be imposed on an employee, except for the knowingly committed offence, in order to avoid in future the concealment of hazardous situations by the staff for the fear of punishment.

To improve the above-described situation, it is necessary to conduct additional trainings and teaching of the staff and ensure the full awareness of the staff of the hazardous situations or a possible consequence of the operation.

The basic training will be conducted in the workplace by HSE manager and will focus the employee's attention on the following:

- the current hazards;
- threat posed risks;
- actions in the emergency situation;
- the basic requirements of the operation of the machinery and equipment;
- necessity to notify about the threat or action thereof.

### **11.3 Training records**

The teachings and trainings shall be recorded in a specially designed log (see Annex 2), while upon the completion of the training, the training conduct form shall be completed, indicating the title of the topic with the signatures of the attended employees. The records should include the date, venue, time of the training, the trainer's name and also be verified with the signatures (see Annex 3; Annex 4).

The training documentation is kept at the safety manager.

## **12.0 People Based Safety Program**

---

The Dariali Energy management is oriented to ensure the maximum involvement of workers in the health and safety management system that is the main condition of the thorough fulfillment and support of the requirements of this system. The main essence of the staff involvement is the permanent and effective control of threats and risks.

The working staff is the category of workers engaged in the hydroelectric power plant operation who directly faces the risk caused by the hazardous environment and actions. So they have the best information and the opportunity to assist the HSE manager to constantly improve and introduce the production safety system, the practical performance of which is effective and result-oriented.

The employees who will be involved in the safety system management, will feel themselves more secure and valued, that encourages them from the side of the company and reduces the possibility of resignation of the employees involved in the system management.

The workers involvement in the safety process is reasoned on the following:

- to provide permanent monitoring;
- to understand the importance of security;
- to identify problem areas;
- to develop the necessary actions;
- to assess the progress and effectiveness of operations;
- to help managers to manage the risks;
- to improve the safety rules and requirements;

The employees involvement should include:

1. **Interview, daily briefings at the shift change**, that is a good method to provide the awareness and feedback.
2. **Identification of hazards in the workplace** - HSE manager (in case of absence –Plant manager, in case of the absence of Plant Manager- Shift Manager) conducts interview with the employees is an effective method of complete hazard detection.
3. **Awareness** - should be clear, simple and complete, understandable for everyone and relevant to the scope of work of employees.
4. **Safety management team** - will be in constant contact with the workers, who will have a chance to raise issues and have concern in the progress of solving these problems.
5. **Employee encouragement** - actively involved employees will be encouraged. “Safe employee of the month” with bonuses for the person, who makes a suggestion or observation that leads to improve safety, or who is always safe.
6. **Warning** - those employees who do not comply with the safety requirements shall be warned and in case of disobedience – subjected to the administrative measures.

The compliance with this system will be one of the means to minimize workplace threats and, hence, the risk factors, that, in turn, will provide the fulfillment of the safety requirements in the hydroelectric power plant operation, will become a solid foundation to minimize industrial injuries and illness, increase industrial productivity and reduce the need in staff substitutes.

### **13.0 Personal Protective Equipment**

---

All employees will be provided with personal protective equipment (PPE), the use of which is the necessity. Dariali Energy considers the personal protection equipment as one of the means of protection against the work threats and provides the placement of the necessary and reserve quantity of PPE at the unit.

An employee will not be allowed to the work without PPE. The employee is responsible for the proper use and maintenance of PPE, and in case of its damage due to the working conditions, the employee is obliged to notify the direct superior or the safety manager about PPE replacement.

The staff’s PPE shall be checked daily by the HSE manager, Shift Manager, Plant Manager in order to exclude the performance of the work with the damaged equipment.

All employees involved in the power plant operation and Headwork will be equipped with the following protective/ weather relevant equipment:

- Helmet (head protection)\*
- Antistatic reflective overalls\*

- Goggles \*
- Solid leather boots with protection of front and rear parts \*
- Hearing protection, when the noise level is higher than it is required by Georgian legislation;
- Gloves (during repair)

Cold weather gears;

***The equipment marked\* is mandatory.***

All visitors should be provided with:

- ✓ Helmet (head protection)
- ✓ Hearing protectors (at specified sites)
- ✓ High visibility vest

Also, during the work in pre-specified places it is necessary to use the personal protective equipment, such as: face protection, safety belts for work at height, joint protective equipment and other. PPE will be identified by HSE Manager and chief engineer. Site staff and workers also will be interviewed during PPE identification.

## **14.0 Safety procedures of hydroelectric power plant operation**

---

### **14.1 Basic safety requirements**

The purpose of the development of requirements is to determine and define safety rules and instructions in order to establish the safe method of work production and minimum standards of training required for the performance which should be provided to the staff involved in the operation in the form of training. Each staff member listed in section 5.1 will have relevant qualification levels (received upon completion of each study/ training) and will act in accordance to its safety knowledge.

At the trainings all the employees will be provided with the information about the possible future consequences of the safe environment and the actions, and in case of the occurrence of the incident, before blaming the employee or the staff, the incident will be investigated in order to determine its causal factors.

HSE manager is responsible for development of the safety requirements. Technical Director together with HSE manager is responsible for the proper work of the safety system and fulfillment of requirements before the Chief Executive Officer.

Dariali Energy provides the development, implementation and control of the performance of the safety requirements by the key employees as well as contractors, subcontractors and temporary workers.

The basic safety requirements of the hydroelectric power plan operation will be oriented at:

- **Recruitment of qualified personnel** - only the certified and experienced staff, selected and recruited by the Dariali Energy managers team will be allowed to work;
- **Hazard identification and risk assessment** - the work will not be performed without the hazard analysis and full risk assessment in accordance with the established procedure;
- **Enhancement of employee's skills through teaching and training** - all employees must undergo the training and obtain full information about the hazards existing at their workplace;
- **Maintenance of good order of the operating equipment and machinery through their permanent control** – it is mandatory to check the machinery and equipment, according

to the procedures established by the manufacturer, and to make records thereof as the evidence;

- **The use of personal protective equipment** – the personal protective equipment established by the risk assessment should be used;
  - **Effective action in emergency situations** - the emergency action plan will be determined, which will describe the role and functions of the employees, which shall be made familiar to the staff prior to the beginning of the work;
- and
- **Avoidance of hazardous operations** - Dariali Energy gives all employees the right to suspend the working process which is performed with the violation of the safety rules.

Any violation of safety requirements is considered as a serious incompliance with the Dariali Energy development policy, that will likely result in administrative disciplinary action, and in case of serious violation, Dariali Energy reserves the right to dismiss the employee.

Minimum requirements for the staff will be the following:

- to attend the safety trainings and to be well aware of the importance of the issue;
- to maintain order and cleanliness in the workplace and to prevent unnecessary overload of the workplace with items, objects and materials; to place the tools and equipment in a safe place when not using them;
- to ensure the constant control of the workplace and at the approach of other employee or visitor to show maximum care and attention; if necessary, explain the process in his or her workplace;
- to strictly follow the manufacturer's safety standards during the operation of the machinery and equipment
- to get involved in the process of safety inspections of the unit in case of inspection of his/her working place;
- not to perform the work, which will not be authorized by Chief engineers and superiors;
- to always use the personal protection equipment designed for him/her and ensure its purposeful use, and in case of damage, to immediately notify thereof for its timely replacement;
- to maintain regular contact with the direct superiors and timely respond to their demands;
- in case of detection of the failure of the machinery and equipment (excessive vibration, sound strange, abnormal rhythm of the operation, the working pressure changes, temperature changes or other) to immediately notify the immediate supervisor and await his instructions;
- to ensure execution of the tasks and instructions given by the superior, and when this is impossible, to provide the feedback from the superior notifying the situation;
- during the shift handover, to provide the transfer of the necessary information to the alternate, to explain the functionality of the equipment and machinery and the detected failure or non-compliance;
- to obey the requirements of the safety signs in the workplace;
- to comply with the smoking policy in the workplace;
- in case of an incident, to get involved the incident investigation process and to provide the true information to the investigation organizers;
- in case of detection of violation of the safety rules by other employees to warn them of fulfillment of the requirements and in case of opposition, to notify the managers thereof.

## 14.2 Turbine Operation and Maintenance Safety

### 14.2.1 Operational Safety Instruction

Recommendations to avoid any operational mode that might be prejudicial to safety:

- Take the necessary precautions to ensure that the machine is used only when in a safe and reliable state. Therefore all safeguarding equipment and safety related equipment as well as noise-dampening and suction and ventilation devices must be available and functioning;
- Operate the machine only if all protective and safety oriented devices, such as removable safety devices, emergency shut off equipment, sound proofing elements and exhausts, are in place and fully functional;
- In the event of malfunctions, stop the machine/plant immediately and lock it. Have any defects rectified immediately;
- Before starting up or setting the machine/plant in motion, make sure that nobody is at risk;
- During start up and shut down procedures always watch the indicators in accordance with the operating instructions;
- Never switch off or remove suction and ventilation devices when the machine is in operation.

### 14.2.2 General Safety Instruction

- Each person, working on or in the surrounding of the turbine will be sufficiently trained (regarding operation of turbine and its running procedures);
- All prohibition-, warning- and action signs, which will be mounted on the turbine should be followed;
- Use required Personal Protective Equipment;
- The access to all safety devices must be ensured at any time;
- The Turbine can be put from operation to a safe operating condition at any time by pressing the Emergency Stop Button;
- The operating and maintaining personnel of the operator must be informed about the location and function of the Emergency Stop Buttons;
- Voltages and hydraulic pressures can still be present after pressing the Emergency Stop Button.

### 14.2.3 Basic Safety Instruction

Turbine operation has to be performed in accordance of Operations Manual.

- Ensure that only authorized personnel works on the turbine;

- Personnel in education may only work on the machine/plant after theoretical training and only under supervision of a qualified person;
- Only an electricity specialist or person instructed by him is entitled to work on electrical systems of the Turbine under his direction or supervision;
- Only competent personnel are entitled to work on pressurized equipment;
- Only personnel with special knowledge and experience are entitled to work on hydraulic equipment;
- The operating and maintaining personnel of the operator must be introduced by qualified persons after completing the installation work;
- The operator is obliged to introduce new operating and maintaining personnel in the same extent and with the same care under consideration of all safety instructions.

The operator is obliged to:

- Check regularly whether the safety instructions are kept in accordance with the manual when working on the turbine;
- Train the operating and maintaining personnel regularly and to confirm their knowledge;
- The operator ensures that all safety-relevant instructions are kept and all necessary symbols and notices are attached in the production area in accordance with the local instructions.

Next symbols and devices to be installed at the place:

- Emergency lighting;
- Fire Extinguisher and information sign – fire prevention equipment;
- Information sign – emergency call;
- Direction sign – exits;
- Direction sign – escape routes;
- Information sign – first aid;
- Observe the national fire protection regulations.

All safety and warning notices on the Turbine will be complete and readable.

#### **14.2.4 General duties of personnel**

In order to avoid personnel injuries and material damages the following safety instructions apply to all persons, working on the turbine:

- Observe the safety instructions mentioned in the manual and attached on the machine;
- In case of safety-relevant malfunctions stop or secure the concerned part of the turbine immediately. Announce and repair the malfunctions immediately;
- Any safety-precarious mode of operation is not allowed;
- Use only the provided entries, routes and aisles;
- Keep the turbine and work place clean and tidy. Do not put down tools and other items on the machine;
- Do not wear clothes or pieces of jewellerys, which enable getting caught by machine parts. Ties, neckerchiefs, rings and chains belong there to;
- Do not wear long hair loose;
- Inform the personnel about the function and malfunction of monitoring instruments before commencing work;
- If necessary, place temporary barriers and limit the entrance when working on the turbine;

- Entering of danger zones is only allowed after the power supply is safely disconnected and the mechanical safety devices are mounted. Protective equipment must not be blocked or bridged;
- Avoid contact with switched-on circuits or rotating parts;
- Use or take along the personal protective equipment in accordance with the instructions of the operator when working on the machine;
- The wear of protective footwear in all the factory premises is mandatory;
- Re-establish the original condition after maintaining;
- If the operating person cannot survey the entire zone of danger, nevertheless make precautions to ensure that no persons are in the zone of danger when issuing control commands;

Set the operating mode to AUTO before leaving the power house in order to ensure that the turbine can be stopped in case of danger.

### 14.3 Work on/in electrical systems

High voltage can lead to heavy or fatal injuries. Therefore it is essential to observe the following:

Work on/in electrical systems must not be carried out unless a permit has been issued by the senior authorized person/Plant Manager. Each staff member listed in section 5.1 will have relevant qualification levels (received upon completion of each study/ training) and will act in accordance to its electrical system safety knowledge/level. Plant Manager will issue order to the relevant staff member who can attend specific work place.

- Operation and maintenance of the machine/plant only by qualified personnel, who has qualification in accordance to the professional knowledge/relevant qualification level;
- A second person must be present when working on live parts. In case of emergency this person can press the EMERGENCY STOP BUTTON or the main switch with shunt trip. Demarcate the working area with a red-white safety chain and a warning sign;
- Use proper insulated tools, protection devices and personal protective equipment and check them before each use;
- It is recommended to make oneself familiar with the safety standards, guidelines and electrical regulations as well as the usual national and proven operating modes for plants (e.g. EN 50110, VDE0104 or IEC-standards). The following steps have to be met as minimum requirement before commencing work on electrical parts:

- ✓ Disconnect completely
- ✓ Secure against re-connecting
- ✓ Verify that the installation is dead (de-energized)
- ✓ Carry out earthing and short-circuiting
- ✓ Provide protection against adjacent live parts

After finishing the work, carry out the above 5 steps in reverse order.

- Regular inspection of electrical equipment of machine/plant. Lacks such as loose connections or scorched cables have to be repaired immediately;
- Use only original locking devices with stipulated amperage;
- In addition to the general safety instructions observe and comply with the local safety instructions and specifications;
- Remove covers and safety devices only after the appropriate ranges are de-energized and secured. Before energizing mount the covers and safety devices again.

#### **14.4 Hydraulic, pneumatic**

- Only personnel with special knowledge and experience are entitled to work on hydraulic equipment, the personnel will be authorized by Plant Manager;
- Regular inspection of pipes, hoses and bolted connections for leakage and externally visible damages (leaking-out oil can lead to injuries and fire). Damages have to be repaired immediately;
- System sections and pressure pipes (hydraulic, compressed air) have to be de-pressurized before commencing repair work in accordance with the module descriptions;
- Hydraulic and compressed-air pipes have to be laid professionally (connections must not be mistaken);
- Armatures, length and quality of hose lines must correspond to the requirements;
- The operating space of the actuators must not be blocked and the access to this space must be properly secured. This applies in particular to closing weights, servo motors and the guide apparatus.

#### **14.5 Lifting and transport of components**

The notices, stated in the following, have to be kept when lifting and transporting components in order to avoid injuries and material damages.

- Do not stay or work below floating loads. Further it is not allowed to ride on floating loads;
- Adhere to the general and also local safety instructions as well as specifications or manuals of the lifting tool or load lifting attachment manufacturer;
- The used lifting tool or transport vehicle must be suitable for the loads to be transported. If a mobile crane is used, take additionally into account that this crane is mounted in accordance with the manufacturer's instructions;
- Usage permission for the crane must be available. Operation of remote controlled cranes only by personnel with proper written driving license;
- The results of the regular lifting tool inspection (inspection log book) must be available;
- All used slinging means (ropes, chains, shackles, eyebolts, lifting eye nuts, S-hooks) must be used only in accordance with the manufacturer's data;
- Secure the loading properly before lifting and transport operations;
- Determine the required space in the power plant or on other provided (temporary) storage areas before commencing with lifting and transport operations. Further make sure that the floor loading is adequate by granting access to the as-built drawings;
- During lifting observe the signs and other written instructions attached on the packings or components; special customer requirements are to be considered, too;
- A "test brake" of the lifting unit is necessary when lifting heavy loads. Lift the load approx. 10 cm and lower it in small steps. After each switch-off, the brakes have to stop the lowering process;
- Use 3D-lifting rings or eyebolts, if provided;
- Direction of crane operation by show of hands or wireless only by responsible specialist.

#### **14.6 Gas, dust, steam, smoke**



Welding, burning and grinding operations on the machine/plant are only allowed if expressly approved by HSE and Plant managers.

- Remove dust and inflammable materials from the machine/plant and its surrounding before welding, burning and grinding operations. Further proper ventilation is to be ensured (danger of explosion)! ;
- If necessary take available national instructions for work in close rooms into account;

#### **14.7 Special safety instructions – Francis Turbine**

##### **Safety inspection after reaching 80% of runaway speed**

If a machine has involuntarily or intentionally reached or exceeded the threshold of an increased speed which is 80% of the runaway speed or has been operated at or above these speeds, then it must be switched off and checked before re-commissioning and repaired if damaged.

Power  $P = 36,827 \text{ MW}$

Minimum head  $H_n = 370 \text{ m}$

Maximum head  $H$

max = 377 m

Maximum discharge  $Q_n = 11,64 \text{ m}^3/\text{s}$

Speed of Turbine and Generator  $n = 375 \text{ rpm}$

Runaway speed of Turbine  $n_{Tmax} = 680 \text{ rpm}$

Level of installation (distributor) 1350 m a.s.l

Runner diameter  $D_a = 2616,4 \text{ mm}$

Number of runner buckets  $Z_2 = 22$

Number of nozzles  $Z_o = 6 \text{ pcs}$

Diameter of nozzle  $D_0 = 208 \text{ mm}$

Sense of rotation „ clockwise“

##### **Maintenance safety**

Observe the adjusting, maintenance and inspection activities and intervals set out in the operating instructions, including information on the replacement of parts and equipment. These activities may be executed by skilled personnel only. Brief operating personnel before beginning special operations and maintenance work, and appoint a person to supervise the activities. For particular components (e.g. oil plant, cooling, heating, etc.) additional maintenance instructions of the respective manufacturer have to be observed. Only undamaged and fully functional parts and original spare parts of the manufacturer solely have to be used during maintenance. In any work concerning the operation, conversion or adjustment of the machine and its safety oriented devices or any work related to maintenance, inspection and repair, always observe the start-up and shut-down procedures set out in the operating instructions and the information on maintenance work. Ensure that the maintenance area is adequately secured. If the machine/plant is completely shut down for maintenance and repair work, it must be secured against inadvertent starting by:

- locking the principal control elements and removing the ignition key;
- attaching a warning sign to the main switch;
- mechanical locking of the Turbine;
- locking of the shutoff device.

### **Accidentally movement of nozzle / deflector**

Danger of shearing and crimping of body parts

For doing service inspections and maintenance work on either the nozzles or the runner it will be imperative to stop the motor of the control pump, and to prevent it from being inadvertently started by unauthorized persons.

For doing service work on the nozzles it will be necessary to drain all pressurized oil of the piping system and take special care to the by spring force pretensioned parts. Only experienced personnel are allowed to work on these parts. Dismantling of the whole nozzle as shown in operation manual is in most cases necessary.

For carrying out overhead assembly work always use specially designed or otherwise safety-oriented ladders and working platforms. Never use machine parts as a climbing aid. Wear a safety harness when carrying out maintenance work at greater heights.

Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice (if any).

Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before carrying out maintenance/repair. Never use aggressive detergents. Use lint-free cleaning rags.

Before cleaning the machine with water, steam jet (high-pressure cleaning) or detergents, cover or tape up all openings which - for safety and functional reasons - must be protected against water, steam or detergent penetration. Special care must be taken with electric motors and control cabinets.

Ensure during cleaning of the machine that the temperature sensors of the fire-warning and fire-fighting systems do not come into contact with hot cleaning agents as this might activate the fire-fighting system.

After cleaning, remove all covers and tapes applied for that purpose.

After cleaning, examine all fuel, lubricant and hydraulic fluid lines for leaks, loose connections, chafe marks and damage.

Any defects found must be rectified without delay.

Re-tighten bolted joints, which loosened during maintenance. The safety-relevant tightening torques is stated in the appropriate drawings.

If safety devices have to be removed during repair and maintenance, re-assemble and check them immediately after finishing repair and maintenance work.

Provide a safe and environmentally friendly disposal of operating supplies as well as of replaced parts.

## 15.0 Generator

### 15.1 Operation Safety

Refrain from any safety-precarious mode of operation!

- Take measures that the machine/plant can be operated in a safe and operational condition. In addition all protective devices and safety related equipment as well as all noise insulations and exhausting equipment have to be available and be in operational condition;
- In case of malfunctions shut-down and secure the machine/plant immediately;
- Before starting the machine/plant make sure that nobody is endangered by the starting machine/plant;
- Exhausting and ventilation devices must not be shut-down or removed with running machine.

The following general precautions shall be taken during each generator operation:

- Avoid any contact with electric circuits. Even electric circuits with low voltage can endanger life. Overvoltage may occur in each electric circuit under certain conditions;
- Generator and control leads, overload protection and earthing must correspond to the national electro-technical instructions and other applicable standards and be conform to the local customary and successful work practices.

### 15.2 Maintenance Safety

The generator and its auxiliary plants are maintained by qualified personnel only. The personnel must be sufficiently trained and be familiar with the operational mode of the generator and its components.

Furthermore a training regarding safety aspects of maintenance is necessary.

- Before starting with the maintenance, the operating personnel of the machine/plant must be informed about these works;
- For particular components (exciter, oil plant, brake-/lifting unit, cooling, heating, etc.) additional maintenance instructions of the respective manufacturer have to be observed;
- Only undamaged and fully functional parts and original spare parts of the manufacturer may be used during maintenance;
- While maintaining the generator, working on the manual governor is not allowed. The turbine must be in locked condition. Coordinated approach regarding turbine guidelines is not essential;
- Before starting with maintenance, the following activities have to be carried out:
  - ✓ Disconnect the generator and all auxiliary plants from the system and protect them against re-start;
  - ✓ Ensure that the turbine cannot be put into operation;
  - ✓ The generator must be de-energized and adjacent energized parts must be covered;
  - ✓ Earth and short-circuit the generator in accordance with the local electrical regulations and corresponding to the usual local work practices;
  - ✓ Switch off the CO2 fire extinguisher.

- Protect the maintenance areas, as far as required, against entry of unauthorized personnel;
- If the machine/plant is completely shut down during maintenance, the following precautions are to be performed in order to protect them against unexpected re-start:
  - ✓ lock main control panel and remove the key;
  - ✓ attach a warning sign on the main switch;
  - ✓ lock the machine mechanically;
  - ✓ lock the stop valve.
- The safety regulations stated in Section Lifting and transport of components have to be adhered to, when replacing single components or larger modules;
- Use the provided ascent supports and platforms or other ones in accordance with the safety requirements when performing maintenance work exceeding the body height. Machine parts must not be used as ascent supports. The use of fall protections is absolutely necessary for maintenance work in higher altitudes. Remove contamination, and ice from handles, footstools, railings, platforms and ladders;
- Re-tighten bolted joints, which loosened during maintenance. The safety-relevant tightening torques are stated in the appropriate drawings;
- If safety devices have to be removed during repair and maintenance, re-assemble and check them immediately after finishing repair and maintenance work;
- Provide a safe and environmentally friendly disposal of operating supplies as well as of replaced parts;
- The local protective regulations are to be observed when conducting electrical tests and working with brushes.

## **16.0 Hydraulic Governor Operation and Maintenance**

### **16.1 Maintenance Safety**

Disassembly, routine repair and maintenance work may only be conducted when the plant is at standstill and has been locked out to prevent it being switched on again unintentionally.

Before hydraulic parts are disassembled, the hydraulic system must be completely de-pressurized. The guide vanes must be closed and locked in closed position.

For components in contact with pressure oil or pressure gas (nitrogen), the safety measures should be selected such that no accidents can happen or damage/environmental pollution occur.

Do not exceed permissible crane loads and weights on lifting gear and ropes/shackles. Secure loads against falling down.

Do not step or walk below suspended loads! Standing below suspended loads can have fatal consequences and thus is strictly forbidden!

The maintenance intervals specified must be observed.

After completion of maintenance work, all required safety devices must be mounted again.

Before beginning any maintenance or repair work the operator must disconnect the power supply to all drives securely. This can be achieved with a service switch, lockable racks in the MCC, or with other suitable measures that comply with the safety regulations.

The operator shall ensure that adequate lighting is provided (with extra-low voltage bulbs) during service and repair work.

Maintenance and upkeep must be carried out by specially trained, skilled personnel only.

All work on the electrical equipment, without exception, must be carried out by skilled electricians.

During maintenance work, personnel must use and carry personal protective equipment along with them in accordance with the national regulations or as specified by the plant operator.

It should be compulsory to wear hard-toed boots throughout the entire mill premises.

For doing maintenance work on the hydraulic governor, it will be necessary to stop the turbine. Due to safety reasons, inlet valve and guide vane mechanism must be properly interlocked to prevent from moving.

For doing maintenance work on the hydraulic governor, it will be necessary to de-pressurize the oil system.

For safety reasons the turbine guide vanes must be properly interlocked to prevent it from moving.

There are the following items for de-pressurizing the hydraulic governor which will have to be carefully selected by the personnel in charge and strictly applied:

- Actuating the emergency trip (guide vane mechanism).
- Closing the main oil supply valve MEX16AA001 for the governor oil, by means of the fixing screw on top of cartridge valve cover and disconnecting the power feed cables to the governor oil pumps from their terminals. This will ensure that no oil pressure will be admitted to the main control block.
- Release the oil pressure in accumulator and actuator and drain oil to the sump tank until readings on pressure gauges is zero (0) bar.

## **17.0 Transport safety requirements**

---

### **17.1 Basic requirements**

The Dariali Energy transport service is oriented to perform thoroughly the transport safety requirements established by the road safety legislation of the country and international standards.

Project related traffic includes transportation of HPP Staff, transportation of different materials for maintenance and repairing, operation of heavy equipment (repairing and cleaning roads at winter and spring time), etc.

Only those employees who have received all relevant trainings and have been authorized by the HSE manager will have access to the Company's transport service.

The driver's qualification must comply with these requirements and the necessary condition is to hold the relevant class state permit in the form of a driver's license., drivers must be authorized by the HSE manager

The safety teaching-training program includes the road and transportation safety topic, which should be attended by all the drivers who shall confirm their understanding of the issues discussed at the training and performance thereof by their signatures on the training records.

The training of drivers will be conducted seasonally, before the coming of winter and summer, and will focus on the safety standards and requirements depending on the season.

Due to the complicated geographic location of the power plant, the emphasis shall be made on the traffic safety and vehicle running order during the winter period and in the existence of clear ice.

Dariali Energy provides the insurance of the vehicles and drivers and takes care of the maintenance of the subordinate vehicles in order to reduce the risk of incidents.

To provide the technical operability of vehicles there will be selected the licensed car services, according to the owned car brands, which guarantee high quality of service;

Also, to control the vehicle order the safety manager shall develop the transport checklists, which will be conducted by the drivers, and in case of detected damage the urgent corrective actions shall be scheduled.

### **17.2 Basic safety requirements for vehicle drivers**

- To survey the vehicle every morning and check:
  - availability of all the necessary documents (driver's license, vehicle's certificate, insurance card);
  - engine operating order;
  - brakes condition;
  - steering condition;
  - headlamps lighting operation;
  - stop-lights operation;
  - turn signals condition;
  - sound signal condition;
  - windshield cleaning condition (checking the washer level);
  - lubricant (oil) and fuel leaks (if any);
  - vehicle fuel level;
  - engine lubricant (oil) level;
  - cooling system and braking system fluid level;
  - functionality of fire extinguishers;
  - oil spill response kit.
- To strictly follow the prescribed safety requirements;
- To start the vehicle engine only by means of starter. Otherwise the vehicle is not allowed to start up;
- The employee shall comply with the traffic rules determined and established by the national law.

- The employee is not allowed to turn off the road and to stop for no reason. The driver may stop on the road only for the purpose and only on the standby section of the safe part of the road.
- The employee is prohibited to transfer the right to drive the vehicle to another person (unless otherwise instructed by the superior).
- The employee is not allowed to use the vehicle for personal use.
- It is prohibited to carry an unknown passenger, if not agreed with the managers.
- It is forbidden to smoke in the car and its vicinity.
- After fuelling the parts spotted with fuel must be cleaned to dry.
- It is prohibited to place or attach the non-operating goods, items, materials, equipment and other items.
- In movement the employee shall obey the traffic requirements, to act according to the road signs and pay attention to the movement of pedestrians.
- When stopping at the prohibiting traffic light the driver shall keep the reasonable distance from the vehicle ahead to provide the traffic safety.
- Approaching the crossroads the employee shall decelerate and cross the intersection only in case there is no front or side threat.
- When crossing the equivalent roads, the priority is given to vehicles moving in from the right.
- The railroad crossing should be made only by the road signs.
- In case of no-gate railway crossing, the vehicle shall stop at least 15 meters away from the railway line and cross the railway line if it is free.
- When crossing the railway line it is not recommended to change the speed, to operate the clutch and throttle (lift on-off) in order to prevent the sudden shutdown of the vehicle engine. The railway line shall be crossed by the even speed.
- It is prohibited to cross the railway line, except for in the specially designed places.
- It is prohibited to clutch off in the downhill movement (neutralization of the traction gear and free movement).
- The engine braking is to be made with the multiple effect on the brake pedal at the wheel-lock edge. It is prohibited a sharp, sudden braking with blocked wheels.
- On the frozen road the braking shall be made without clutch off and by a smooth and multiple (dotted) effect on the brake pedal by the foot.
- The maximum speed on the open road (highway) should not exceed 80 km/h, and in the turn - 10 km/h. In the inhabited and crowded places a maximum speed shall be 40 km/h (unless the road signs provide otherwise).
- The employee is obliged to keep a safe distance from the vehicle ahead in order to have the possibility and time for maneuvering in case of emergency (by reducing speed, timely stop, keeping aside).
- The safe distance in the open road shall be equal to three-time speed in terms of meters;
- In winter conditions (surface icing) the safe distance in meters shall be more than 3 time the speed magnitude.
- The vehicle ahead may be overtaken only in case the vehicle ahead moves with the speed less than the allowed one. Overtaking is allowed only in case of good visibility when the

passing line is free and in case of sufficient distance to the oncoming vehicle. Before the overtake the driver shall appraise the traffic on both sides, while the overtake spacing (the distance between the vehicle and the vehicles moving on the side) should be at least 1 meters. It is prohibited to boost the speed by more than 20 km/h when overtaking.

- In case the vehicle gets out of order when elimination of the failure by the employee is excluded, the vehicle should be placed on the right roadside edge, the warning signs shall be placed and the incident shall be notified to the managers;
- The employee should only come from the vehicle after immobilization of all car mechanisms and appraisal of the roadway.
- During movement of the vehicle on the road with the limited visibility (twilight, travel at night, atmospheric effects) it is necessary to reduce speed to a minimum and to switch off the cabin lights.

## **18.0 Personnel health issues**

---

When recruiting the staff Dariali Energy will assess the health status of individuals, in order to exclude complications of chronic or other types of disease during performance of the work. All employees shall be obliged to provide a health certificate (Form N 100) and be responsible for the validity of this document. For the company, only those health issues which would prevent a person from fulfilling the responsibilities will be considered in deciding on employment.

During execution of the work the state of health of all employees will be supervised by their immediate superiors and the safety manager.

All employees will be provided with health insurance, which also provides for the annual preventive examination, which will be also subject to check by the Company.

In order to prevent occupational diseases, all employees will be provided with the necessary standard personal protection equipment, and the necessity and effective use of this equipment will be informed to the employees at the trainings conducted. The plan of actions in case of injury of an employee is described in Section 17.8.

All the necessary first aid equipment will be available at the facilities,. The periodic inspection and, if necessary, updating of this equipment will be organized by the safety manager.

## **19.0 Actions in case of emergency**

---

### **19.1 Description of emergency**

The health and safety service understands the state of emergency as a situation resulted from an incident, while an incident can be defined as follows: An **incident** is an event that has caused or may cause an undesirable consequence.

The emergency is the development of the following events:

- landslide;
- fire;
- explosion;
- degree of injury of the employee that prevents him/her from doing the job;
- technical damage of equipment;



- the situation caused by violation of the health and safety requirements;
- attack to the facility or a gross violation of the security procedures;
- a car accident;
- the need for evacuation of personnel caused by any reason;
- fall into water;
- rockfall or collapse of the underground works

For an effective and organized response to each of these incidents the present procedure has been developed, which includes the following:

1. The action plan in the case of landslide;
2. The sequence of actions in case of fire hazardous situation;
3. First aid actions in case of injury of an employee;
4. The actions of the physical security officers in case of detection of an attack to the facility or other violation.
5. Action plans for car accident, explosion, evacuation, attack to the facility, fall into water, rockfall or collapse of the underground works

In the state of emergency caused by an incident, the actions shall be conducted in accordance with this procedure. The procedure is a document that is completed and changed according to practical experience gained by its use.

Any deviation from the scheme approved by this procedure shall be agreed upon with the Dariali Energy Technical Director and the management.

Amendments and additions shall be supervised by the security service under the agreement with the Technical Director

## 19.2 Incident control

In case of the incident, its mandatory for all employees to report to their senior manager. The process of management of an incident occurred at any facility of the hydroelectric power plant is controlled by HSE manager.

The control system consists of 4 main elements:

- Identification of the state of emergency and the effective organization of subsequent actions;
- Exact distribution of the staff roles and responsibilities;
- The operational communication and notification system;
- The guarantees of the prompt mobilization of the resources required for the incident elimination;

Identification of emergencies is classified as confirmed and unconfirmed incidents:

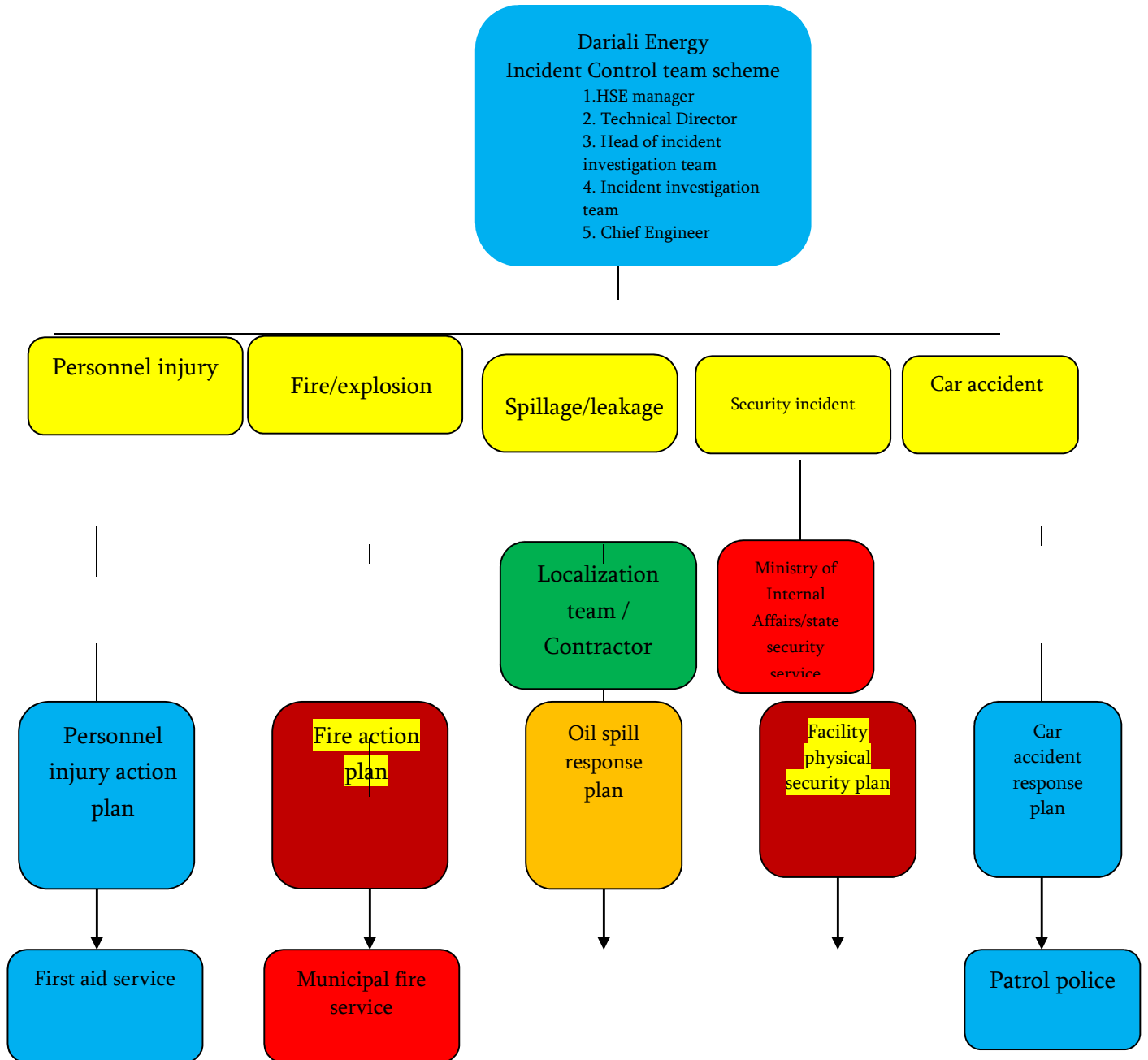
A **confirmed incident** is a case of emergency, which is confirmed by the staff;

In case of a confirmed incident the emergency management plan shall be immediately activated and despite the scale of emergency all relevant and necessary resources shall be mobilized.

An **unconfirmed incident** is a case of emergency, when the notification is not verified by the notification from the second reliable source and the issue shall be clarified as soon as possible.

Upon the receipt of notification about the alleged case of emergency, all the appropriate resources shall be alerted and the appropriate measures shall be taken to verify the incident and determine its exact location.

Below is given the Incident Control team scheme:



### 19.3 Notification and callout procedure

All the employees involved in the operations are required to act in accordance to the procedure in case of any incident. The notification structural scheme with the telephone directory must be displayed in a conspicuous place on the facility. The contact numbers of the municipal rescue services shall be attached thereto.

### 19.4 Duties of the Incident Control team members

#### 19.4.1 HSE manager

All employees are required to act in accordance to the first aid knowledge during emergencies and then directly inform firstly HSE manager and Plant Manager. During emergencies HSE manager performs the following duties:

- visits the scene and confirms the type and severity of the situation;
- plans the sequence of the incident localization and gives instructions in accordance to the current situation
- continuously monitors the performance and effectiveness of the instructions;
- ensures the personnel evacuation from the facility;
- ensures cooperation with the municipal rescue group;
- controls the threat emerging from the hazardous areas at the facility;
- provides the control of the access to the scene;
- provides the information about the current situation to the Technical Director and CEO;
- after incident localization confirms the completion of the incident;
- conducts the incident investigation determining the causal factors;
- develops the procedures to protect the reactivation of the incident causal factors;
- introduces the mechanisms to of control of the incident causal factors and conducts the monitoring of their implementation.
- ];
- develops the scene and facility physical security mechanisms with allocation of the security posts;
- cooperates with the municipal officials (Ministry of Internal Affairs, the State Security Service);
- controls the scene and facility protection mechanism;
- sets the access control at the scene and monitors the actions of the security officers;
- participates in the evacuation of staff and takes them to the safe zone;

- ensures organization of the control over the taking out and storage of the values from the facility;
- after the incident, organizes the accounting of the available stock and values;
- takes part in the incident investigation and identification of causal factors;
- develops the mechanisms for the protection from the recurrence of the factor contributing to the incident and controls its implementation.

#### **19.4.2 Technical Director**

During emergencies, Technical Director performs the following duties:

- confirms the type and severity of the incident;
- declares a state of emergency;
- gives instructions to the HSE manager/ Plant manager and controls the performance of these instructions;
- provides the information to the Chief Executive Officer;
- cooperates with the chiefs of the municipal rescue services;
- after the incident ,assesses the situation and if necessary plans the combination of the necessary corrective measures.

#### **19.4.3 Head of Incident Investigation team**

After emergencies head of investigation team performs the following duties:

- visits the scene and confirms the type and severity of the situation;
- makes relevant instructions based on the information received from Incident Investigation team
- gives instructions for the following unit and persons:
  - the controlling building manager;
  - the powerhouse specialists;
  - the incident response team;
  - the security officers;
  - the fire team;
  - the personnel in charge in the incident place;
- provides the control of the access to the scene;
- provides information about the state of incident to HSE manager, Technical Director;
- makes a decision and issues the order to call the municipal rescue services;
- after the incident, arranges the procedure of investigation of the incident causal factor , identifies it and ensures the control of implementation of the measures to protect from recurrence;

Investigation team receives instructions from Head of Investigation team, HSE manager, Technical Director;

After the instruction the team makes sure they:

- follow given instructions;
- follow the instructions of the first aid;
- are aware of the safety requirements during incident;
- follow the instructions of use the firefighting equipment;
- follow the instructions of placement of the necessary equipment for incident localization;
- follow the instructions of evacuation plan and its sequence;
- follow the instructions of the electric safety requirements;
- to be able to assess the scale of current threat from dangerous zones and provide the information to the Head of incident control team;
- to act together with the representatives of the municipal rescue service for the incident localization;
- to ensure the evacuation of people;
- during the incident localization, before the start of the facility operation, to provide the monitoring results to Head of the Investigation team;

#### **19.4.4 Formation of Incident Response Team**

Incident localization team is formed beforehand any possible emergency situation to ensure correct performance during the emergencies. HSE manager forms the team as agreed with Technical director.

Team consists of: Plant manager/authorized person; Headwork and Sediment basin operators (in case the emergency is on the Headworks); person in the shift (in case the emergency is in the Powerhouse)

#### **19.4.5 Chief Engineer**

During emergencies Chief Engineer performs the following duties:

- visits the scene and confirm the type and severity of the situation;
- provides the information to the incident investigation team;
- gets involved in the incident response team operations;
- ensures the execution of the incident response plan and gives the necessary instructions to the incident response team members;
- provides the full information about the current situation, if necessary, to the representatives of the municipal rescue service, taking into account the following data:
  - explains the hazardous areas at the facility and, hence, the scale of possible risk;

- inform about the places and exact quantity of the hazardous materials (flammable, explosive, chemical or other) at the facility;
  - introduce the facility layout;
  - inform the number of the facility staff;
  - inform about the places of location and quantity of the stock and equipment designed for the incident localization at the facility.
- after the incident, ensures organization of the working site;
  - After the expiration of the incident takes part in the incident investigation to determine the causal factors;
  - ensures the permanent control of the factors contributing to the incident for the subsequent operation of the unit.

### **20.0 Person in charge at the incident site**

A person in charge at the incident site is viewed as a person who: has detected a near-miss; has witnessed the development of the incident; has discovered technical problems; has been in the vicinity of the place of incident or has been a cause of the incident development by himself. During the incident, the person who has detected as well as his/her senior manager are responsible for the incident.

The person responsible for the incident site (in physically able) shall:

- assess the current situation and the hazard generated by the incident in case of its possible development;
- immediately notify the immediate superior of the incident;
- warn all employees and take safety measures;
- cooperate with the incident response team members and provide the necessary information;
- take part in the evacuation of personnel;
- comply with the superior's instructions;
- after the incident take part in the incident investigation in order to determine its generating factors.

### **21.0 Representatives of contractor-company**

In case of the incident development the manager of the contractor-company present at the facility shall:

- upon declaration of the state of emergency issue the operations suspension order;
- evacuate its staff and mobilize them at the gathering site;
- at the gathering site report to the person responsible the total number of their employees and the number of those present on the site.

The same will be performed for DE staff by HSE manager/Plant Manager

### **22.0 Visitors**

A visitor to the site, in case of occurrence of the incident and declaring a state of emergency, is obliged to leave urgently the area towards the specified emergency exits, appear timely at the

assembly point and report his/her name. Assembly point will be described in the evacuation plan, which will be notified to any visitor.

### **23.0 Action in case of landslide alert**

The necessity is to provide the permanent direct communication with the landslide point monitoring group. The communication must be made by several means: radio transmission, mobile phone, and voice alarm. The communication availability should be checked daily and in case of identified fault should be corrected immediately.

The alarm system will be installed at all facilities of the power plant complex. Its voice notification should be different from the local signaling notification.

The landslide generation alarm shall be heard in the following main areas:

1. Tunnel entrance;
2. Transformer unit;
3. Tunnel;
4. Turbine hall;
5. Water intake.

The closest distance from the landslide point to the entrance of the tunnel is 11 km. According to the approximate calculations made by the specialists, the maximum developed speed of 1.5 million m<sup>3</sup> volume mass descending from the altitude of 4602 m to the elevation of 1363 m will be 60 km/h. based on these calculations, the movement of the landslide from the center to the Tergi valley will take about 10 minutes. We can assume that from the landslide generation notification before the entrance of the landslide to the valley there are at least 5 minutes for evacuation. This time should be used effectively for quick evacuation actions.

#### **23.1 Tunnel entrance and transformers building**

It is necessary to install the voice alarm at the entrance of the tunnel, which shall have the capacity to cover the noise in the valley and timely notify the personnel, in order to provide their due evacuation in the direction of the tunnel.

#### **23.2 Tunnel**

The tunnel is seen as less risky landslide area in case of landslide development. As the landslide mass represents the glacier and rock talus developed by the impact of precipitations, this mass may loose that will dynamically reflect in its distribution possibilities.

To provide more security the movement deep to the tunnel shall be at least 100 meters. This point will be marked in tunnel and appropriate sign will be installed;

Given the unpredictable scale of the landslide and the past disaster experience, it is possible that the Tergi valley may be blocked repeatedly, which will cause the flow to stop. In this case the large-scale rescue operations will be required in the valley, during which the movement in the valley will be impossible, and the staff working in the tunnel may stay in the workplace until the valley is not rehabilitated for the first time. Taking this into account, it is desirable to store the food and drinking water in the turbine hall warehouse subject to the necessary conditions.



The need in this stock is also determined by the severe winter conditions, because the access road to Stepantsminda and the valley are often blocked due to the high snow cover and movement of sediments of the river Tergi tributaries. The quantity of the food and drinking water to be stored shall be determined by the number of staff working and must be controlled by managers, in order to avoid a deficit in case of emergency. HSE manager will supervise and check once in a two weeks the food/water storage.

The necessity is the first-aid kit which is described in section 24.6

### **23.3 Landslide period**

The landslide center represents the unstable glacier slope, and the phenomena was provoked by heavy rainfall and high temperatures, with glacier slope melting.

With this in mind, the excess hazard period will be taken the spring rainy season, that is typical in April and May, and the period from the second half of July to September, when the air temperature reaches a maximum.

The necessity is to pass by transport through the landslide zone without stops and to prohibit slow movement or stops of the vehicles in this zone.

### **23.4 Staff's actions in the landslide alert**

In case of landslide alert the necessity from the side employees is the following:

- to immediately stop any operations and to move in the direction of evacuation;
- to appear at the place of gathering;
- to explain to the responsible person about the situation created at his/he whereabouts and to recall if somebody is still in the vicinity;
- to wait for the incident control center instructions;
- after the incident, to act according to the instructions given by superiors. .

## **24.0 Fire safety**

### **24.1 General requirements**

During the Dariali Energy hydroelectric power plant operation the priority is given to the establishment of fire safety requirements and the control over their performance. The company takes into account the fire safety requirements in force in Georgia and is guided by the law "On the Fire Safety of Power Facilities".

The company management will ensure the training of the staff to get them aware of the fire safety requirements and to further deepen the knowledge by the practical training, with the pre-defined periodicity. The staff will pass the practical training how to use fire extinguishers, which will be organized by the safety manager.

The potential sources of fire will be studied and assessed in advance, and the specific plans of action in case of ignition will be determined according to the workplaces and sites and the staff must be made aware of their role and functions in case of ignition.

Evacuation plans and notification telephone numbers will be displayed at all working sites, in easy-to-see places. Also at the exits there will be installed the reflective direction indicators which in case of the lighting problem will show in the right direction. The emergency lighting system is installed.

The facilities will be also equipped with the mechanical emergency notification devices, which will be placed in the vicinity of fire extinguishers, for the timely notification of the staff before the general fire alarm. The availability of refractory felt is also foreseen.

### 24.2 Fire safety system

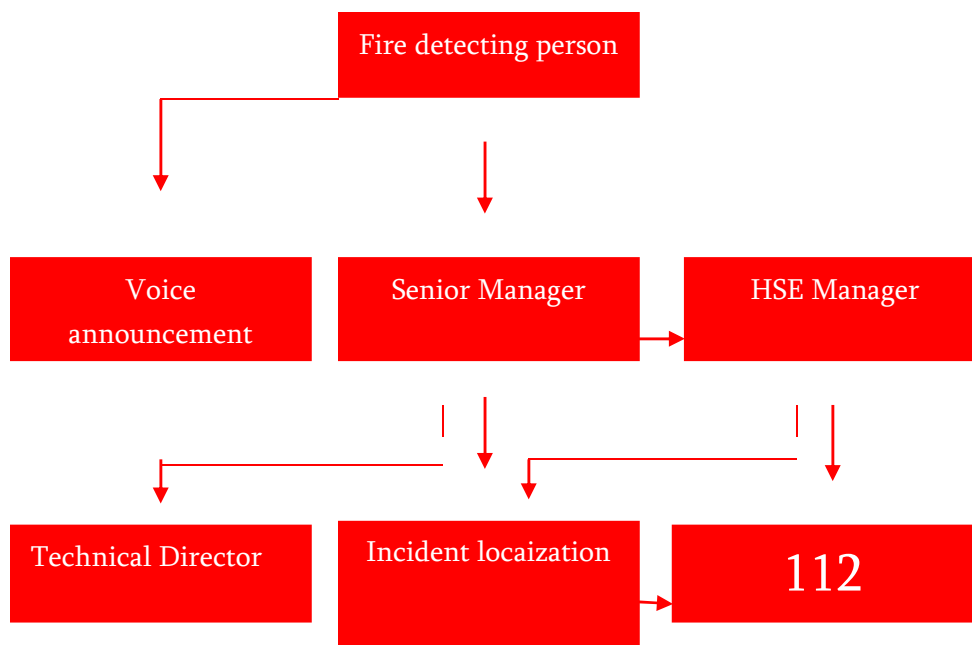
All of the objects of the power plant are equipped with fire safety systems; The systems include fire alarms.

Facilities will be equipped with portable fire extinguishers of small size, which type will be determined as a result of the assessment of the potential source of fire. Electrical equipment will be provided with the carbon dioxide extinguishers of the appropriate size and the fire extinguishers layout chart will be displayed in the workplaces.

The fire stands with full will be installed at the predetermined areas for the effective action in case of complicated ignition.

### 24.3 Communication chart and sequence in case of fire detection

The fire alarm notification shall be performed in the sequence determined by the following chart:



The person detected the fire (person in charge at the incident) first of all shall notify the senior manager and activate the voice announcement to notify all employees. For this he or she shall use a mechanical alarm signal, and then the general fire alarm is set on.

After the alert notification Senior Manager informs HSE manager and Technical Director who will notify the Chief Executive Officer.

Senior Manager and HSE manager work together to localize the incident and if necessary, the state rescue service will be notified.

#### **24.4 Actions in case of fire detection**

In case of fire or smoke detection the sequence of actions of the employees should be the following:

- to switch on the fire alarm system;
- to notify immediately the superior and safety manager;
- make safe any machinery or equipment and then stop and leave.
- to assess the situation, to survey the fire center and surrounding areas;
- in case of small fire to use the fire extinguisher;
- as far as possible to take the equipment and machines from the areas, where the spread of fire is possible;
- to disconnect the electrical installations;

If the fire is strong and it is difficult to approach the fire center, and at the same time any fire-hazardous or explosive areas/substances are located in the vicinity, then:

- The staff should be removed from the dangerous zone:
  - notification to the superior and the safety manager;
  - during evacuation to act according to the evacuation scheme;
  - when crossing the smoky indoor area, to bend, because the air is the cleanest at the floor, to close the nose and mouth with a piece of cloth (preferably soaked with water);
  - in case of impossibility of evacuation because of the burning exit, to call the rescuer;
  - to notify the superior and the safety manager about the accident;
  - to wait for the rescue team and provide to them the detailed information about the causes of the fire and the situation in vicinity of the fire center;

If the fire is not strong, the fire center is easily accessible and the access does not endanger the health of the staff, but there are certain risks of fire spreading to surrounding areas, then the staff will act as follows:

- to give fire notice to the superior and the safety manager;
- to find the nearest fire stand and take the necessary firefighting equipment (fire extinguisher, ax, crowbar, bucket, etc.);
- to liquidate the fire center according to the instructions applied therein;

- if the fire the electrical equipment connected to the circuit is located in the vicinity of the fire center, the use of water for fire extinguishing shall be excluded;

In case of fire originated from electric appliances, the appliance shall be disconnected from the source of power and then the response to the fire extinguishing shall be performed.

The incident response team (staff trained to use fire extinguishers) shall act in the following order:

- to inform about the fire the incident control center and fire crew;
- using the available the forces and facilities to take urgent measures to save people;
- to check the operability of the automatic fire-prevention system (fire notification, fire extinguishing, anti-smoke protection);
- If necessary, to switch off the electricity (except for fire-protection systems), to stop the equipment, aggregates, machines, to close fuel, gas, steam and water communications, to stop the work of the emergency ventilation systems and in the neighboring areas;
- to perform other activities that will contribute to the prevention of fire and smoke spread in the building premises;
- to stop all works on the object (if it is possible by the production process), except for works relating to the liquidation of the fire;
- to take all employees which are not involved the fire extinguishing, outside the dangerous zone,
- before the arrival of the fire crew to provide the general management of the fire extinguishing in consideration of the specific properties of the object);
- to ensure compliance with the fire safety rules and requirements by the people involved in the fire extinguishing;
- along with the extinguishing fire to organize the evacuation and protection of material assets;
- to arrange the meeting with the firefighting units and with their help to find the shortest ways to the fire center;
- in order to ensure the security of the firefighting personnel to provide to the firefighting units participating in the fire extinguishing and emergency rescue operations the information about the dangerous and explosive substances which are stored in the facility.
- upon the arrival of the firefighting unit provide to the chief of the firemen the information about the constructive and technical features, the adjacent buildings, premises and facilities, the quantities and fire-hazardous properties and other information required for the successful elimination fire, as well as to organize the engagement of the forces and means of the facility in the implementation of the necessary measures to extinguish the fire.

The use of water on electrical wiring and electrical assemblies is prohibited before the power cutoff.

#### **24.5 Evacuation in case of fire**

If the evacuation it necessary, it should be organized by the unit and the safety manager. The movement shall be made in the emergency direction and the use of other ways and exits shall be prohibited. The emergency exits shall be constantly monitored on the cleanness and easy passage and shall not be obstructed with any objects and materials. The personnel shall gather for evacuation at the predetermined gathering place, where the absence of any employee may be find out. Appearance at the place of gathering is the necessity in order to prevent the planning of the absent employee's rescue operations.

In case of absence of an employee, he or she shall be identified and his or her place of work shall be determined; with the help of other employees the information about his or her supposed last whereabouts will be obtained, and the information shall be transmitted to the local rescue team; based on the information received from the rescue team the employee may be quickly found and his/her state assessed.

The assembly places will be organized in the safe and easy-to-reach places of all facilities of the power plant complex where the signs marking the assembly place will be installed.

To provide effective implementation of the evacuation, the practical exercises will be arranged with the emergency training and monitoring of the employees involved. During the emergency training it is necessary to leave the workplace and to immediately appear at the place of assembly.

#### **24.6 Actions in case of injury of the staff**

In case of injury of any employee/personnel at the facility, another employee should immediately notify the immediate superior and first aider to provide the first aid and call an ambulance (according to the degree of injury assessed by the certified first aider).

Dariali Energy will ensure that working sites of all facilities of the power plant complex have 1 or 2 persons who will be able/are near to provide the first aid before the arrival of the local emergency medical service, to assess the state of the injured and to provide first aid and will help the local emergency medical service in the awareness of the injured's state, specifying the injury cause.

It may be considered to evacuate the injured by local forces. In this case the person who has provided the first aid will agree transportation with the provider clinic or the doctor of the local hospital. In case of confirmation, the injured should be transported by the method instructed by the doctor and under the constant supervision.

Any fact of injury of the employee/personnel that takes place at the facility should be documented in a special register specifying the cause and the circumstances.

Personnel will be equipped with the first aid kit and stretchers for the providing the medical emergency assistance before the arrival of emergency, if necessary.

First aid boxes be kept in the Powerhouse, Control room, Headworks

The First Aid kit shall include the following:

N	Name	Quantity s
1.	First aid instructions	1
2.	List of the first aid box content and the register of its use	1
3.	Alcohol-free antiseptic pads	10
4.	Adhesive plaster	20
5.	Neck-lock	1
6.	Sterile dressing 7.5 x 4.5 cm.	2
7.	Sterile cotton	1
8.	Sterile bandage	2
9.	Latex gloves	1
10.	Scissors	1
11.	Pin	12
12.	Sterile eye pad	1
13.	V-shaped bandage	2
14.	Ammonia solution	1
15.	Oxygenated water	1
16.	Analgetics (pill "Ketamo")	1
17.	Burn ointment ("Salbesan")	1

#### **24.7 Equipment damage**

The devices and machinery shall be operated in accordance with the instructions by the manufacturer and the Rules of Technical Operation of Power Plants determined by the country's legislation. Their check and inspection to be carried out in the pre-arranged intervals. for the check there should be prepared questionnaire (checklists) with the list of the main and auxiliary parts of the device, along which the state detected as a result of the check and the preventive and corrective measures shall be noted. .

During the operation of the equipment, the constant control shall be set on their characteristics resulting from their working conditions such as noise, vibration, working pressure level (if any), connections, etc.

In case of change of any above characteristics, the operator must immediately notify the superior and receive the instructions to take further action.

#### **24.8 Actions in case of attack to the facility or other security incident**

##### **24.8.1 Police Security**

The employer has hired the Police Security to ensure 24 hours safety. In case of the attack of the facility and any other security incident, Police Security will act in accordance to the established safety procedures/measures. Police Security is not armed.

### **2.4.8.2 Actions in case of traffic accident**

The following conditions are considered as the state of emergency:

- any scale in a traffic accident;
- any scale of inflammation;
- the failure of vehicle's electrical system;
- failure of suspension parts and mechanisms;
- possible hazard caused by natural disasters (earthquake, hurricane, landslide, flood, atmospheric discharge, landslides, complicated visibility on the road, winter conditions hindering traffic or other circumstances).

Action plan and sequence during a possible state of emergency will be determined by the HSE manager and they should conduct periodically the trainings how to act in case of accidents.

Any emergency situation must be assessed individually, and consistent measures must be taken to neutralize the dangers of the situation.

In case of a traffic accident HSE manager shall be informed and the patrol police called.

In case of injury of the personnel during the accident, the ambulance service shall be notified and the injured should be provided with the first aid.

In case of inflammation during the road accident, the fire service, Patrol Police, Medical Aid shall be immediately notified and fire extinguishing means shall be used to neutralize the fire. Extinguishers should be used also to neutralize the inflammation of a stranger's vehicle, if this vehicle poses a threat to Dariali Energy's vehicles. EBRD will be notified if the accident involves private citizens.

### **24.8.3 Staff trainings and readiness for actions in case of emergency**

All employees will receive the first aid training, this obligation is provided in accordance to the Georgian legislation.

Each employee working on the electric devices under 1000 V and employees working on the devices above 1000 V will receive relevant trainings.

The training and teaching of the employees in the issues of actions in case of emergency should be conducted in advance, before the start of their work, by Dariali Energy HSE manager. All employees engaged in the power plant operation have to undergo periodic training for emergency actions. The frequency is determined by the position of the employee and the nature of their work to be performed. The trainings shall be organized with the annual, semiannual, quarterly and, if necessary, monthly frequency. The practical trainings for actions of the employees in case of possible state of emergency shall be arranged. The training should include the following topics:

- actions in case of landslide;
- action in case of injury of the personnel;
- the first aid actions;
- the use of fire extinguishing equipment;
- inflammation neutralization by firefighting equipment (practical);
- personnel safe evacuation to the gathering place;

- spill localization sequence;
- use of anti-spillage equipment;
- electrical safety requirements;
- hazard assessment and analysis;
- risk assessment;
- emergency assessment (action plan, sequence of actions and implementation of actions);
- actions in extreme conditions (complicated atmospheric phenomena).

The organization, implementation, testing, and results of the staff training should be documented and the records shall be updated according to all training seasons.

#### 24.8.4 Emergency communications

Emergency communication are radios and cellular phones which will be kept in the powerhouse, control room, headwork at all times. During the shifts emergency communication will also be with shift managers. At all times, all cellular phones will be kept with plant manager, shift managers, also at the Headworks, Sandbasin and Powerhouse.

#### 24.8.5 Contact information in case of emergency

<b>Dariali Energy Incident Control Team</b>				
<b>First name and surname</b>	<b>Job title</b>	<b>Position</b>	<b>Telephone #</b>	
Temur Rusishvili	HSE manager	Incident Control Center	595153331	
Konstantin Iordanishvili	Technicall Director	Incident Control Center	599720230	
Tamazi Urekadze	Chief Engineer	Incident Control Center	598732707	
Ilia Kamkamidze	Chief Engineer	Incident Control Center	598760796	
Police	Municipal rescue service	112	122	
Municipal fire service	Municipal rescue service	112	111	
Emergency medical service	Municipal rescue service	112	113	



Security police service	Municipal rescue service	112	125	

The researches were conducted by the local qualified companies and groups, as well as by internationally institutions.

The research findings and recommendations are the priority for the Dariali Energy, the strict monitoring of which is implemented in the continuous regime.

The implementation of the plans approved by the recommendations is set out in the program, which is fulfilled and provided by the company’s management.

During the construction, the strict control of the contractor-companies which are engaged in the construction were provided to minimize the impact on the environment. The environmental plan has been developed for the contractors, the monitoring of fulfillment of which is continuously implemented by the Dariali Energy.

The design of the HPP includes construction and completion of a fish pass which confirms the company’s commitment to maintain river biodiversity and efforts to mitigate any potential environment impact. Effective design and management of fish passes are essential importance for the maintenance of free passage for fish and other aquatic species during migration season. The fish path incorporated into the design of Dariali HPP will create maximum natural conditions to the ichthyofauna of river Tergi and will enable the current fish population of brown trout to migrate freely to find the best places to feed, shelter, spawn and grow.

Dariali Energy has invested significant time and effort in the development of a Biodiversity Action Plan (BAP) and Monitoring Programs to maintain the conservation status of the River Tergi. The company has appointed specialist advisors “Blue Rivers” to develop the BAP and provide independent monitoring of its effectiveness. During HPP commission the fish pass has been proven to be utilised by migrating fish and is therefore fully effective.

Dariali HPP project is the first energy project to deliver carbon neutral construction in Georgia. The project includes a reforestation component which would target the full compensation of all emissions associated with the project over its lifecycle through the capture of carbon in vegetation. For implementation of reforestation project, the Company cooperates with the University of Natural Resources and Life Sciences of Austria (BOKU). The Austrian specialists' group together with Georgian counterparts extensively studies the Kazbegi territory, carries out field works and other consultative activities.

## **25.0 Safety audit and inspections**

Dariali Energy provides the assessment of the efficiency of the safety system performance through audits and quarterly inspections on all project sites. HSE manager will provide Safety audits and

quarterly inspections on the following: labor protection, sanitary and hygienic conditions, living conditions, health conditions, Regular audits will be conducted on a monthly basis, inspections will be conducted on a quarterly basis Also, in case of detection of violations of safety rules and requirements, the ad hoc audit will be conducted to identify the reasons of the existing violations and corrective measures thereof. All inspections and audit results will be documented.

The audit will be conducted in all working sites of the power plant complex, and will examine the performance of the safety requirements of the operating process, the necessary documentation, technical condition of the equipment, the staff's readiness for the emergency actions.

The audit will involve the following persons: Technical Director, safety manager, chief engineer, chief of the controlling building and the employees in the workplace.

The audit will be conducted through the poll of the personnel, visual survey of the equipment and the workplace, inspection of necessary documents and assessment of the compliance of the safety rules by the workers.

The detected failures will be recorded in the audit results and verified by the signatures of the persons involved, and will be sent to the Chief Executive Officer.

The records should also describe the necessary preventive measures for correction of identified failures and avoidance of their future recurrence, the specific performance terms and responsible persons.

## **26.0 Reporting**

---

HSE manager provides the internal health and safety reporting on a quarter basis which is submitted to Technical Director The reporting is designed to improve the operation safety system through the monthly assessment of the safety system and timely analysis of hazards.

Incidents and fatalities will be reported immediately to the Lenders.

Collection of safety data and information, assessment and analysis enable to keep the statistical records of incidents, identifying their casual factors which are the determining means of the priorities from the operational hazards and the basis for the prevention of incidents.

The Safety Report shall include the description of the activities implemented by the safety officers, conducted training, the results of the audit, the planned safety measures and arrangements to be taken in the next month and the following necessary data;

- 1) The number of employees;
- 2) The number of hours worked;
- 3) The numbers of incidents/accidents;
- 4) The number of "near-miss" incidents;
- 5) The number of absent hours resulted from traumas;
- 6) LTIF (lost time injury frequency) which is calculated by the following: the number of lost-time incidents divided by the number of hoysr worked
- 7) First aid;
- 8) The number of value damages;

- 9) Fatal cases;
- 10) Work-related injuries/illness;
- 11) Traffic accidents;
- 12) Weekly inspections;
- 13) Audits;
- 14) Risk assessment-all possible risk (health, fatalities and etc.) assessment at all project sites ;
- 15) Hours of training;
- 16) instructional hours;
- 17) Mileage of vehicles; ;
- 18) Suspension of work for safety reasons;
- 19) Incident investigation;
- 20) Incident notification.

Prior to operations, the Dariali HSE manager should conduct a comprehensive inspection/audit that the facility and all infrastructure meet safety standards, including ladders, electrical cables, emergency lighting in place, evacuation routes are marked, first aid kits are present, records are properly maintained, barriers and/or tethers are provided at all high places.

## **27.0 Annexes**

---

Annex 1 Risk assessment

Annex 2 Trainings log

Annex 3 Training records

Annex 4 Dariali Energy training matrix

Annex 5 Evacuation egress system



## 27.1 Annex 1 Risk assessment document

<b>Dariali HPP operation project</b>		Date:		<b>Risk assess. N</b>	<b>000</b>
<b>Working site</b>		<b>Risk assessment team</b>			
<b>Description of the work to be performed</b>  e.g. . scheduled repair of turbines		<b>First name and surname</b>	<b>Position</b>	<b>Signature</b>	
<b>Necessary additional information</b> (e.g. emergency action plan, first aid instruction, additional PPE, tools, equipment and so on) :			Risk assessment verified: Chief Technical Officer		
<b>Equipment and machines to be used:</b> E.g. crane, welding apparatus and so on			First name and surname:		
			Signature:		
			Date:		

Description of the work to be performed					Risk assess. N			000					
1. action sequence number	2. Action required for performance of the work	3. hazard description	4. Hazard exposure	5. Available control measures	6. Initial rick			7. Detailed list of controlling and preventive measures	8. Responsible person	9. Remained risk			10 Risk lowest level
					Severity	Probability	Risk			Effect	Probability	Risk	
1					Average	Low	6		Average	Low	6	Yes	
2													
3													
4													



**27.2 Annex 2 Training Logs**

#	Attendees (trainees)		Training topic	Trainer	
	First name, surname	Job title		First name, surname	Signature
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					

**27.3 Annex 3 Training records**

Training records			
<b>Date:</b>	<b>Place/location of training:</b>	<b>Trainer</b>	
<b>Started at:</b>		<b>signature:</b> .....	
<b>Duration: :</b>		<b>Other trainers:</b>	
<b>Training topic:</b>			
No	First name and surname	Job title	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			



## 27.4 Annex 4 Dariali Energy training matrix

<b>Training</b>	<b>Technical Director</b>	<b>Chief engineer</b>	<b>Senior Shift managers</b>	<b>Senior Shift managers assistants</b>	<b>Senior hydraulic engineer</b>	<b>Headwork unit operators</b>	<b>Sediment basin operators</b>	<b>Turbine operators</b>	<b>Hydraulic equipment specialist</b>
Hazard identification									
Risk assessment									
Lifting operations									
Elevated jobs									
First aid									
Personal protective equipment									
Cat safe driving									
Chemicals									
Incident investigation									
Waste management									
Fire safety									
Fire extinguishers									
Emergency actions									
Electrical safety									
Workplace safety requirements									
Machine and equipment user's manuals									
Tools – annual and electrical									

### 27.5 Annex 5 Evacuation egress system

