

## EMERGENCIES AT POWER PLANTS

### Basic information

Duration (ECTS)	360 hours (10 ECTS credits)
Starting date	February, 1
Language of instruction	English level B1 (European Framework for Reference of Communicative Skills)
Entry requirements	BSc or MSc degree in Environmental Sciences or Heat power engineering

### Course description

The course "Emergency situations on power units" includes theoretical basics of factors and mechanisms of emergency situations occurrence on the power complex units. Practical part of the course is designed to provide students with thorough knowledge of the main features that should be taken into account for calculation and design of security protection systems on power units.

### Special features

Krasnoyarsk Krai is one of the largest states of Russian Federation, which economics is based on industry. A variety of power units is spread along a large territory from moderate climate zone to severe arctic regions, what leads to a great diversity of engineering tasks connected to construction and management of industrial power units. After successful completion of the course graduates will easily identify possible emergency situations, predict and estimate risk of chemical accidents on power units. They will be able to perform calculations of the accidents with emission of chemical dangerous substances and define their destruction zones.

### Course aim

The aim of the course is to prepare specialists that are able to solve safety issues in order to eliminate emergencies on power units. It is designed train a highly skilled professionals with profound knowledge of factors and nature of emergency situations on power units and engineered safety features of protected units.

### Course objectives

- to give students a profound knowledge of material, scientific and technical basics of technical safety on power units;
- to provide students with a variety of skills required for examination of power units, identification of possible emergency situations, organization of protection procedures and planning of procedures directed to elimination of consequences caused by accidents;
- to make students familiar with safety control procedures applied for power units of different complexity located in different environmental conditions;
- to develop skills of forecasting and managing of emergency situations on power units including protection of people and organization of personnel actions in emergency situations.

## Learning outcomes

Upon successful completion of the course students will:

- be able to use prediction methods for prevention and control of emergency situations on power units;
- be able to organize protection procedures of people and the personnel in emergency situations;
- know material, scientific and technical bases of safety procurement of power complex units;
- organize medical first aid and other urgent works in order to eliminate consequences of emergency situations on power units;
- define possible destruction area as a result of an accident on a power unit;
- apply calculation methods for accidents with emission of chemical dangerous substances, dumping of oil and oil products on power units;
- analyze and assess reliability and the technogenic risks;
- make scientific literature, technical reference books and standard documentation adaptable for different purposes;
- estimate potential danger of industrial objects to human and surrounding nature;
- monitor technosphere and analyze the results in order to make short-term and long-term forecasts of situation development.

## Discipline content

Week	Lectures	Seminars/Practice	Hours
1-3	Classification of transport accidents, fires, explosions, sudden emissions of oil and gas, collapse of residential and industrial buildings and constructions.	Definition of characteristics and parameters of the shock wave as a result of accidents, flammable explosions of combustible gases, dumping of oil products; calculation of an intensity of thermal radiation and a probability of human defeat.	90
5-8	Accidents with emission of dangerous chemical substances occurred on power units.	Calculation of a damaged area and an admissible period of human operation in a radioactive polluted district; an assessment of a radiation situation resulted from nuclear weapon explosion ; an assessment of a radiation situation on an object polluted by radioactive materials after accident on nuclear power plant.	90

14-18	Basic principles and safety methods for protection of population, workers and employees	Evacuation management and determination of evacuation scheme for a specified number of persons; determination of required levels of security.	90
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	of energy units in emergency situations. Information, material, scientific and technical basics.		
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### **Course assessment**

Upon completion of the course students will need to pass an exam.

### **Attendance policy**

Organization of individual studies is performed in accordance with the schedule of educational process. Students will be given electronic publications, multimedia presentations and electronic video materials. Midterm assessment will be organized through e-mail communications.

### **Contact information**

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