

In the event of any differences in interpretation of this guide the Finnish version shall take precedence over this translation

LICENSING OF THE OPERATORS OF NUCLEAR
POWER PLANTS

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GENERAL

Only persons licensed by the Institute of Radiation Protection (IRP) are authorized to manipulate the plant system control devices in the main control room of the nuclear power plant. These persons are in this guide called nuclear power plant operators.

In its decision IRP licenses each operator to act in those duties, which have been defined for him in the task description presented by the holder of the nuclear power plant. The license is pertinent to plant unit.

The minimal occupancy of the main control room in each operational situation and the licenses to be presupposed on the persons belonging to this occupancy are defined in the technical specifications of the nuclear power plant.

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LICENSING CRITERIA

Persons, who

- have the degree of an engineer or technician or equivalent basic technical education,
- have participated in a special training aiming at the competence of a nuclear power plant operator, and
- possess sufficient work experience and nuclear power plant experience

may be licensed as nuclear power plant operators.

More exact requirements imposed on the basic education

work experience and special training are presented in the guide YVL 1.7 Requirements for the nuclear power plant personnel.

An operator license presupposes further a medical examination, passing of a written examination, passing of an oral examination and demonstration of skill in work. At new nuclear power plants an interim license is given without demonstration of skill in work in order that the reactor could be loaded and the plant be taken in operation. Demonstration of skill in work during power ascension tests is a prerequisite for the renewal of the license in the stage the tests according to the commissioning programme have been completed.

For the training of operators IRP separately licenses operator apprentices, who have the right to manipulate the control room devices under the supervision of a licensed operator.

The prerequisites for the license of an operator apprentice are a medical examination and passing of a written examination.

On the request of the holder of the nuclear power plant IRP may license as operators representatives of companies having participated in the plant delivery if they have in their home country acted in corresponding tasks. In that case passing of an oral examination and the documentation mentioned in section 3.3 of this guide are the prerequisites.

The operator license is valid for two years at a time.

The prerequisites for a new license are a medical examination, a regular control room work, participation in retraining and passing of an oral examination. If the control room work has not been regular or the participation in retraining has not been sufficient, IRP may also presuppose a new written examination. If a licensed operator is absent from control room work uninterruptedly for three months, the license becomes invalid and IRP shall be informed of the matter without delay.

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LICENSING PROCEDURE

3.1

Operators for a new nuclear power plant

Operators for a new nuclear power plant shall be licensed before fuel loading.

The licensing is initiated by presenting to IRP

- a list of the operator candidates and of duties thought for them
- information of the basic education, work experience and special training of each candidate
- a medical certificate of the state of health of each candidate
- dates of the required examinations.

Written examinations are arranged in accordance with chapter 5 of this guide and separate acceptances are asked for the examination results.

An oral examination is held after the candidate has been accepted in a written examination. An operator license may be applied for after passing the oral examination.

A possibility to demonstrate skill in work is arranged during plant commissioning.

3.2

Operators for a nuclear power plant being in operation

When new operators are needed for a nuclear power plant being in operation they are first licensed as operator apprentices. For this purpose the holder of the nuclear power plant presents to IRP

- a list of the operator apprentice candidates
- data about the basic education, work experience and special training of each candidate
- a medical certificate of the state of health of each candidate
- date of the written examination

An operator apprentice license may be applied for after a successful written examination.

When the operator apprentice has worked in the control room for a sufficiently long time and he has also been in occasion to demonstrate skill in work, an oral examination is held for him. After passing that examination an operator license may be applied for.

3.3

Foreign operators

In case representatives of companies having participated in the plant delivery are to be licensed the holder of the nuclear power plant presents to IRP

- a general description of the licensing procedure of nuclear power plant operators in the home country of the persons in question

- a list of the operator candidates and of tasks thought for them
- a certificate of the nuclear power plant operating experience of each candidate
- dates of the oral examinations.

An operator license may be applied for after passing of the oral examination.

3.4

Exchange of duties

If a licensed operator is to be changed over to another duty, a written examination shall first be arranged for him and after passing it an oral examination shall be arranged. A new license may be applied for after passing of the oral examination.

The holder of the nuclear power plant shall further take care of that the exchange of duties and receiving of a new license do not cause an essentially prolonged interval between the medical examinations to be made to the operator.

3.5

Transfer to a parallel plant unit

If a licensed operator is to be transferred to a parallel plant unit, he has to participate in an oral examination in which the differences between the plant units are discussed. A license may be applied for after passing of the oral examination.

The holder of the nuclear power plant shall further take care of that the transfer to a parallel plant unit and the acquisition of a new license do not cause an essentially prolonged interval between the medical examinations to be made to the operator.

3.6

Renewal of a license

For the renewal of a license the following information is presented not later than one month prior to the expiration of the validity of the license

- a medical certificate about the state of health of the candidate
- possible absences from control room work which are longer than the normal annual vacation
- information of participation of the candidate in retraining program
- date of the oral examination

Renewal of the license may be applied for after passing of the oral examination. If IRP also considers a written examination to be necessary, it will be separately notified of.

If a license has become invalid, one shall follow the procedure presented in section 3.2 of this guide.

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MEDICAL EXAMINATION

The medical examination is carried out by an authorized physician. More detailed instructions on the tests and laboratory investigations relating to the examination are given by the physician of IRP directly to the examining physician. Therefore it is recommended that the examinations are concentrated on physicians, who are also otherwise responsible for the health services of the nuclear power plant personnel.

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WRITTEN EXAMINATION

The holder of the nuclear power plant is responsible to take care of the practical arrangements of the written examination.

The holder of the nuclear power plant shall deliver his own question propositions, 7 to 8 questions, to IRP not later than two weeks prior to the examination. If IRP does not consider the difficulty grade of the questions as appropriate, the holder of the nuclear power plant is requested to present a new set of questions. After having evaluated the difficulty grade to be appropriate IRP adds to the question set 2 to 3 own questions. IRP does not alter the questions presented by the holder of the nuclear power plant. The IRP representative will bring the question papers to the examination occasion and administers the performance of the examination. If needed, the IRP representative may also give practical instructions concerning the arrangement of the examination. The holder of the nuclear power plant shall appoint at least one supervisor for the examination for the whole duration of the examination. The duration of the examination is at most 4 hours.

Copies of the answers of the participants are delivered to the IRP representative immediately after the examination. The nuclear power plant representative presents his judgement answer by answer to IRP and asks for IRP confirmation on the judgement.

In the written examination the candidates are presumed to know

- the functional and operational principles of the reactor

- principal features of the functions, structure and operation of the systems of his own nuclear power plant unit
- the functioning of the main control systems and protection systems of the plant unit in different disturbance situations
- the main features of the system operational instructions, plant operational instructions and emergency instructions of the plant unit
- radiological safety regulations
- the most important administrative regulations concerning the plant unit

Examples which clarify the difficulty grade and nature of the written questions are found in Appendix E of reference /1/. The scope and difficulty grade of the questions are chosen in accordance with the proposed operator duties.

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ORAL EXAMINATION

The holder of the nuclear power plant has the main responsibility for the arrangement of the oral examination. The representative of IRP will participate in the examination occasion making some questions of his own, and judges for his part the knowledge of the candidate.

The oral examination is arranged in the main control room separately for each candidate. In the examination the candidate shall know

- the technical specifications of the plant unit
- the functions of the plant systems, automatic operations and manual control in both normal operational situation and disturbance situations

- the alarms coming to the control room and the measures to be taken due to alarms
- the location of each indicating and control device in the control room
- the administrative procedures related to the control room work.

In the examination the candidate is not presupposed to have detailed data in his memory but he shall know the matters so well that he can answer the questions fluently by using the documentation available in the control room.

In connection with the oral examination a plant tour is made to ascertain that the candidate knows the location of the important components, and that he is able to use control devices outside of the control room if needed.

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VERIFICATION OF SKILL IN WORK

The holder of the nuclear power plant shall arrange for each candidate a possibility to participate in several different control measures. These shall include a start up of the plant (heating and passing criticality), power ascension, power decrease shut down (subcriticality and cooling), operation of an auxiliary system needed occasionally and periodical testing of components.

For the license application statistics shall be prepared indicating the number of control measures performed by each person.

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RETRAINING

The nuclear power plant holder is obliged to take care of regular retraining of the operators. Operator participation in training shall be documented.

Requirements imposed on the training programme are described in more detail in Guide YVL 1.7 Requirements for the nuclear power plant personnel.

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LITERATURE

1. A Guide for the Licensing of Facility Operators, Including Senior Operators, NUREG-0094, U.S. Nuclear Regulatory Commission, 1976