ENSI-B11

Guideline for
Swiss Nuclear Installations

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Emergency Exercises

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Swiss Federal Nuclear Safety Inspectorate ENSI

Emergency Exercises

Issued October 2025

Guideline for Swiss Nuclear Installations ENSI-B11/English (translation of original)

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1 Introduction

The Swiss Federal Nuclear Safety Inspectorate (ENSI) is the regulatory authority responsible for nuclear safety and the security of nuclear installations in Switzerland. ENSI issues guidelines in its capacity as the regulatory authority or based on a mandate in an ordinance. Guidelines are enforcement aids that convert legal requirements into concrete terms and facilitate uniform implementation. They also put the current state of the art of science and technology into concrete terms. ENSI may authorise deviations in individual cases provided that the proposed solution is at least equivalent in terms of nuclear safety and security.

2 Legal basis

This guideline is based on Article 8 letter f of the Ordinance of 14 November 2018 on Emergency Preparedness in the Vicinity of Nuclear Installations (EmPO; SR 732.33) as well as Article 70 para. 1 letter a of the Nuclear Energy Act of 21 March 2003 (NEA; SR 732.1).

3 Subject and scope of application

Guideline ENSI-B11 regulates the requirements for the preparation for and performance of emergency exercises. In addition, it defines the implementation of the general emergency exercises to be carried out in the vicinity of nuclear installations as part of the radiological emergency preparedness framework under the supervision of the Federal Office for Civil Protection (FOCP) for the nuclear installations required to participate by the Emergency Protection Ordinance.

This guideline applies to nuclear power plants (NPP) in operation or undergoing decommissioning, the Würenlingen Central Interim Storage Facility (Zwilag), the Paul Scherrer Institute (PSI) and the nuclear research facilities at the École Polytechnique Fédérale de Lausanne (EPFL).

The requirements in this guideline apply analogously to nuclear installations that are in post-operational or decommissioning lifetime phases, taking into account the changing hazard potential accordingly.

4 Organisation and implementation of emergency exercises

4.1 Nuclear power plants, PSI and Zwilag

4.1.1 General requirements

a. The licence holders must perform the following emergency exercises annually:

   1. Emergency exercises inspected by the regulatory authority as per letter b

   2. Internal emergency exercises

b. Emergency exercises inspected by the regulatory authority include the following types of exercises:

   1. For nuclear power plants:

      - Alarm emergency exercises (AEE)
      - Staff emergency exercises (SEE)
      - Plant emergency exercises (PEE)
      - Plant emergency exercise focusing on deployment of the fire brigade (PEE/F)
      - Plant emergency exercises focusing on deployment of the police (PEE/P)
      - General emergency exercises (GEE)

   2. For Zwilag:

      - Alarm emergency exercises (AEE)
      - Staff emergency exercises (SEE)
      - Plant emergency exercises (PEE)
      - Plant emergency exercise focusing on deployment of the fire brigade (PEE/F)

   3. For PSI:

      - Alarm emergency exercises (AEE)
      - Staff emergency exercises (SEE)

- Institute emergency exercises (IEE)
- Institute emergency exercise focusing on deployment of the fire brigade (IEE/F)

c. The elements of the emergency response organisation specified in the emergency preparedness regulations of the licence holder must take part in at least one emergency exercise each year. This requirement does not apply to elements of the emergency response organisation which are not directly required to respond to technical emergencies, radiological events and security emergencies, or whose tasks in the event of an emergency largely correspond to their tasks during normal operation. Guideline ENSI-B10 applies to personnel subject to approval.

d. The licence holders must ensure and document that all elements of the emergency response organisation have taken part in exercises every four years according to their tasks within the overall structure. It must be apparent from the documentation which elements of the emergency response organisation have undergone exercises and at what frequency. There is no documentation obligation for elements of the emergency response organisation whose training level is already verified in the course of other regulatory procedures.

e. The licence holders must ensure that, alongside the emergency room (ER), the use of the premises to be made available as per Section 10.1 of Guideline ENSI-B12 is incorporated into the emergency exercises as per letter a:

   1. At least every four years the back-up emergency room (BER)
   2. for nuclear power plants, additionally the external emergency centre (EEC) at least every six years

f. With regard to the preparation, implementation and evaluation of emergency exercises in accordance with letter b, the requirements set out in Appendices 2 and 4 must be complied with.

g. The contents of the exercise concept and the exercise scenario must be in accordance with Appendix 3. For PEE/P, rather than a detailed list of expected procedures, the definition of objectives to be achieved is permitted for cooperation with police forces.

h. The scenarios of emergency exercises must be based on the emergencies represented in the emergency regulations of the nuclear installations. They must enable the performance of procedures and actions as per the emergency instructions and accident regulations, as well as enabling the implementation of Severe Accident Management Guidance (SAMG) as realistically as possible for nuclear power plants.

i. Introductory or accompanying events for emergency exercise scenarios must also take into account circumstances that may complicate the work and procedures of the emergency response organisation.

j. For emergency exercises of the SEE and GEE type in nuclear power plants, a beyond design-basis scenario is to be assumed, allowing the exercise of the transition from emergency instructions and accident regulations to SAMG. Where possible, directly adjacent nuclear installations should be involved in the exercises.

k. Within the framework of emergency exercises as per Section 4.1.1 letter a number 1, PSI and Zwilag must select a scenario every eight years which requires protection measures for the population as per Appendix 2 of the Ordinance of 11 November 2020 on Civil Protection (Civil Protection Ordinance, CiPrO; SR 520.12) in the special hazard zone as per Art. 4 para. 1 and Appendix 3 EmPO, and which enables them to exercise the interfaces with external emergency response organisations.

l. A PEE/F or IEE/F type exercise must be conducted within an eight-year period, taking into account the involvement of neighbouring or the installation's fire brigades.

m. In nuclear power plants, an emergency exercise of type PEE/P must be carried out within a period of eight years that requires the involvement of police forces.

4.1.2 Exercise management, exercise observation and exercise control

a. All organisations participating in an exercise must be integrated into the exercise management.

b. For the exercise types SEE, PEE, PEE/F, PEE/P, IEE and IEE/F, an exercise director must be designated. In a GEE, a local exercise director must be designated for each participating nuclear installation. The tasks of the exercise director include the following:

   1. Development of scenarios for the nuclear installation

   2. Definition of the exercise objectives for the elements of the installation's own emergency response organisation participating in the exercise

   3. Organisation of the installation's internal exercise management

   4. Coordination of the preparation, implementation and evaluation of the emergency exercise taking into account the requirements as per Section 4.1.1. letter f

5. Coordination with external bodies participating in the emergency exercise

c. For exercise observation and evaluation, competent personnel must be assigned as exercise observers at the workplaces of those being exercised. They must not interfere with the exercise in any way.

d. Where necessary, an exercise supervisor must be appointed to control the sequence of the exercise in-situ. The latter must not provide any information on the correct performance of an activity.

e. The same person may perform the functions of exercise observer and exercise supervisor.

4.1.3 Simulations and plant parameters

a. In emergency exercises, suitable simulations shall generally be used to enable actions as close to reality as possible.

b. In nuclear power plants, the plant parameters (ANPA) of the technical process planned for the scenario must be generated either by the plant simulator or using alternative means.

c. The plant parameters generated in the plant simulator or using alternative means as per letter b must always be transmitted to ENSI in real time.

4.2 EPFL

a. Once per year, a walkdown of the nuclear test facilities with the relevant safety bodies and the fire brigade must be carried out.

b. Every two years, emergency exercises must be performed in the form of site evacuation exercises of the whole institute under different conditions (operational reactor or reactor shut down).

c. The dates for walkdowns and emergency exercises as per letters a and b are to be notified to ENSI at least three months in advance.

d. Walkdowns and emergency exercises as per letters a and b must be documented. Reporting is based on the requirements as per Section 4.4.4 of Guideline ENSI-B02.

4.3 Safety and security during emergency exercises

a. Emergency exercises must be organised and performed in such a way that will not impair the safe and secure operation of the installation and will not

expose anyone to any risks. As a rule, an exercise shift group should be designated for installations with a shift work pattern.

b. When planning the safety and security provisions, the following aspects must be considered and identified in the exercise scenario:

   1. Conditions for the start and the end of the exercise
   2. Use of alarm equipment
   3. Handover of keys
   4. Walkdowns in special areas focusing on occupational safety, radiation protection and security
   5. Internal and external communication
   6. Procedure if a real accident occurs

c. If any deficiencies regarding safety or security in the installation exist at the time of the planned exercise, the exercise director must prevent the exercise from starting or interrupt an exercise in progress.

d. Documents used or produced in connection with emergency exercises that contain information that should be protected, must be classified and treated as specified in the legal and regulatory information protection provisions.

5 Supplementary requirements for emergency exercises

5.1 Internal emergency exercises

a. The purpose of the exercise is to optimise the organisation, leadership and use of resources in emergency situations by the instruction and training of emergency groups both individually and jointly.

b. The exercise objective is that the emergency elements know the tasks assigned to them as per the emergency documentation and are able to implement them. The detailed objectives are to be defined according to internal training requirements.

c. Exercise participants are to be specified according to the internal training requirement.

d. The duration of the instruction and training must be based on the installation’s internal training requirements.

5.2 Alarm emergency exercises (AEE)

a. The purpose of the exercise is to check that the emergency response team can be reached as specified in the emergency preparedness regulations.

b. Objectives of the exercise:

   1. The units responsible for raising alarms issue the necessary alarms in due time.

   2. Personnel readiness according to the time requirements defined in Section. 4.1 letter e of ENSI B12 is achieved.

c. The following elements must participate in the exercise:

   1. The unit responsible for raising alarms in the nuclear installation

   2. The emergency response team

5.3 Plant and institute emergency exercises (PEE/IEE)

a. Purposes of the exercise:

   1. Review of the cooperation between the emergency response team and other emergency elements of the nuclear installation.

   2. Review of the expediency of the emergency response organisation, the management, the locations and management facilities.

   3. Review of notification and information activities.

b. Objectives of the exercise:

   1. Internal and external alarms are raised correctly.

   2. Operational readiness of the installation's internal emergency response organisation is reached within the specified time limits.

   3. The emergency director and the emergency response team translate their knowledge into orders in a situation-dependent, coordinated and timely manner.

   4. The immediate measures to be taken are known at all levels.

   5. Optimal use is made of the human and material resources available.

   6. Contacts and connections with all parties are ensured.

   7. Notification of the authorities occurs within the prescribed time limits.

   8. Employees, the media and the public are informed using up-to-date communication channels. This takes place promptly, is based on facts, has been quality-checked and is appropriate for the dialogue group.

The informing process has been agreed upon with the relevant authorities in terms of content, timing and communications tools to be used.

c. The following elements must participate in the exercise:

   1. The emergency response team.

   2. The main elements of the remainder of the emergency response organisation as defined in the emergency preparedness regulations.

d. Exercise duration:

   1. Three to five hours in nuclear power plants.

   2. At least 2 hours in PSI and Zwilag.

5.4 Staff emergency exercises (SEE)

a. Purposes of the exercise:

   1. Review of the emergency response team's management and working processes, and its use of resources.

   2. Review of cooperation with teams from the various external bodies.

   3. Review of notification and information activities.

   4. Review of the expediency of team organisation and command posts.

b. Objectives of the exercise:

   1. The emergency director knows the management principles and applies them in response to the situation.

   2. In leading the emergency response team, the emergency response team leader sets a pace for management actions which is appropriate to the situation; activities such as immediate measures, assessments, decisions, orders, control and monitoring must be clearly recognisable.

   3. The emergency response team members are aware of their technical duties within the framework of the team work process.

   4. For nuclear power plants, the transition from accident regulations to SAMG takes place in a timely and situation-appropriate manner.

   5. Notification of the authorities occurs within the prescribed time limits.

   6. Employees, the media and the public are informed using up-to-date communication channels. This takes place promptly, is based on facts, has been quality-checked and is appropriate for the dialogue group. The informing process has been agreed upon with the relevant authorities in terms of content, timing and communications tools to be used.

c. The nuclear installation’s emergency response team must participate in the exercise.

d. The duration of the exercise must be at least 2 hours but no more than 24 hours.

5.5 Emergency exercises focusing on deployment of the fire brigade (PEE/F, IEE/F)

a. Purposes of the exercise:

   1. Review of cooperation between the emergency response team, the on-site fire brigade, other emergency elements and external fire brigades.
   2. Review of organisation at the damage site of the on-site fire brigade and any other fire-fighting organisations that may be involved.
   3. Review of notification and information activities.

b. Objectives of the exercise:

   1. Operational readiness of the emergency response team and the installation's fire brigade is achieved within the specified times.
   2. The immediate measures to be taken are known at all levels.
   3. The emergency director and the on-site fire brigade’s director of operations translate their knowledge into orders in a situation-dependent, coordinated and timely manner.
   4. Optimal use is made of the human and material resources available.
   5. Contacts and connections with all parties are ensured.
   6. Notification of the authorities occurs within the prescribed time limits.
   7. Employees, the media and the public are informed using up-to-date communication channels. This takes place promptly, is based on facts, has been quality-checked and is appropriate for the dialogue group. The informing process has been agreed upon with the relevant authorities in terms of content, timing and communications tools to be used.

c. The following elements must participate in the exercise:

   1. Emergency response team
   2. On-site fire brigade
   3. External emergency services, insofar as provided for in the scenario

d. The duration of the exercise must be at least 3 hours.

5.6 Emergency exercises focusing on deployment of the police (PEE/P)

a. Purposes of the exercise:

   1. Review of the ability to detect and assess the effects of an unauthorised action.
   2. Review of the behaviour as per the applicable alarm concept.
   3. Review of preparedness and coordination between all required internal and external emergency services.
   4. Review of notification and information activities.

b. Objectives of the exercise:

   1. An unauthorised action is detected and identified promptly.
   2. Internal and external alarms are raised correctly.
   3. The operational readiness of the emergency response team and other emergency response elements is quickly established.
   4. The initiation of immediate measures and the ordering or other measures occurs promptly.
   5. Cooperation between the emergency response team, other installation emergency elements and police forces is coordinated.
   6. Clear lines of responsibility and cooperation between the installation's emergency response organisation and the police forces are regulated and complied with.
   7. Notification of the authorities occurs within the prescribed time limits.
   8. Employees, the media and the public are informed using up-to-date communication channels. This takes place promptly, is based on facts, has been quality-checked and is appropriate for the dialogue group. The informing process has been agreed upon with the relevant authorities in terms of content, timing and communications tools to be used.

c. The following elements must participate in the exercise:

   1. Emergency response team
   2. Security guard unit
   3. The main elements of the remainder of the emergency response organisation as defined in the emergency preparedness regulations insofar as this is provided for in the scenario.

d. The duration of the exercise must be at least 3 hours.

5.7 General emergency exercises (GEE)

a. Purposes of the exercise:

   1. Review of the cooperation between the nuclear power plant's emergency response organisation and the external emergency response partners.

   2. Review of the cooperation between the emergency response team and other elements of the nuclear power plant's emergency response organisation.

   3. Review of the expediency of the emergency response organisation, the management, the locations and management facilities.

   4. Review of notification and information activities.

b. Alongside the overarching objectives of a GEE as defined by the general emergency exercise management of the FOCP, the exercise objectives of a PEE as per Section 5.3 and, in addition, the following objectives also apply to the nuclear power plant which is participating in the exercise:

   1. The procurement of external material for accident management must be implemented promptly after the need has been identified and using the appropriate processes.

   2. The transition from accident regulations to SAMG must take place in a timely and situation-appropriate manner.

c. The following elements must participate in the exercise:

   1. The emergency response team.

   2. The main elements of the remainder of the emergency response organisation as defined in the emergency preparedness regulations.

d. Exercise duration:

   The active participation of the whole emergency response organisation of the nuclear power plant participating in the exercise should not exceed 16 hours. Insofar as the scenario requires this, a contact point must be established by the NPP participating in the exercise.

This Guideline was adopted by ENSI on 07 October 2025.

ENSI Director: Signed by M. Kenzelmann

Appendix 1: Terms (taken from the ENSI Glossary)

Internal emergency exercise

Internal emergency exercises are exercises that are not inspected by the regulatory authority. This includes, in particular, exercises as part of the training of the emergency groups as per the nuclear installation's training schedule.

Exercise participants

Exercise participants are those persons who fulfil a function within the emergency response organisation on the basis of the emergency exercise scenario.

Elements of the emergency response organisation

Elements of the emergency response organisation are organisational units of the nuclear installation that are assigned tasks in emergency management according to the emergency preparedness regulations of the nuclear installation, for example monitoring, operating, electrical and mechanical engineering or first aid station.

Exercise supervisors

Exercise supervisors control the workflow of the exercise on site, for example by issuing directives and providing scenario inputs.

Exercise protocol

The exercise protocol is the chronological representation of the measures and actions undertaken by the emergency response organisation during the exercise. The protocol is used for the chronological calibration of participants' own observations for the purpose of drawing up the inspection report.

Exercise scenario

The exercise scenario refers to the practical implementation of the exercise concept and comprises all the information and arrangements required to conduct the exercise. These include all processes, actions, postulated system failures, measured values and safety provisions required for the exercise.

Exercise observers

The exercise observers observe and evaluate the work of the exercise participants at the work locations. They do not interfere with the exercise in any way.

Exercise report

In the exercise report, the licence holder taking part in the exercise documents the exercise scenario together with the exercise protocol, key observations and findings, an assessment of attainment of the objectives and, where applicable, measures to be implemented.

Exercise concept

The exercise concept primarily provides information on the exercise objectives and an idea of the postulated event sequence (scenario).

Exercise shift

The exercise shift is the shift team that is deployed during the exercise in the installation simulator, but which, during the exercise, does not perform any tasks in the day-to-day running of the installation.

Appendix 2: Time requirements

AEE

Date and time [months]	Player	Addressee	Work step	Remarks
	Nuclear installation	ENSI	Submission of AEE initiation procedure	Immediately after internal revisions
H + 1	Nuclear installation	ENSI	Submission of exercise report	

SEE, PEE/IEE

Date and time [months]	Player	Addressee	Work step	Remarks
H - 6	Nuclear installation	ENSI	Agreement on date of exercise	
H - 5	Nuclear installation	ENSI	Submission of exercise concept	Contents as per Appendix 3
H - 3	Nuclear installation	ENSI	Submission of exercise scenario	Contents as per Appendix 3
H + 1	Nuclear installation	ENSI	Submission of exercise protocol	
H + 2	Nuclear installation	ENSI	Submission of exercise report	

PEE/F, IEE/F, PEE/P

Date and time [months]	Player	Addressee	Work step	Remarks
H - 12	Nuclear installation	Exercise participants	Exercise management training	
H - 5	Nuclear installation	ENSI	Submission of exercise concept	Contents as per Appendix 3

H - 3	Nuclear installation	ENSI	Submission of exercise scenario	Contents as per Appendix 3
H + 1	Nuclear installation	ENSI	Submission of exercise protocol	
H + 2	Nuclear installation	ENSI	Submission of exercise report	

GEE

Date and time [months]	**Player**	**Addressee**	**Work step**	**Remarks**
H - 5	Nuclear installation	ENSI	Submission of exercise concept	Contents as per Appendix 3
H - 3	Nuclear installation	ENSI	Submission of exercise scenario	Contents as per Appendix 3
H + 1	Nuclear power plant	ENSI	Submission of exercise protocol	
H + 2	Nuclear power plant	ENSI	Submission of exercise report	

H: Time of exercise

Appendix 3: Minimum content requirements

		Relevant document	
Contents	**Detailed definition**	**Exercise concept**	**Exercise scenario**
Exercise code word	Working title for the emergency exercise	X	
Objectives of the exercise	Specific objectives that are as measurable as possible for the individual emergency groups participating in the exercise	X	
Date, time	Date and time as agreed with ENSI	X	
Exercise director	The exercise director is specified by name. If he or she is not responsible for preparation of the exercise, the person responsible for this will also be specified.	X	
Exercise participants	List of the internal emergency groups participating in the exercise	X	
Rough idea of the emergency exercise	Postulated event sequence, initial situation, cause, effect and measures	X	
Drawings and schemes	Basic drawings and schematic diagrams for documentation of the rough idea	X	
	All drawings and schematic diagrams in the exercise		X
Simulations	General and technical simulations planned	X	
	General and technical simulations implemented with detailed information (where, when, what, how, real-time transmission yes/no)		X
Script with attachments	Detailed time schedule with expected actions, information on reports/notifications, significant parameter progressions, etc.		X
Instructions	Necessary instructions used in association with the emergency exercise		X
Safety and security	Provisions for ensuring safety and security during the emergency exercise		X
Exercise observer	List of the exercise observers showing their names and tasks		X
Arbitrator	List of the exercise supervisors showing their names and tasks		X

Relevant accident and emergency regulations	List of the installation's internal regulations and instructions likely to be applied during the accident	X

Appendix 4: Exercise plan

Installation	Beznau NPP	Leibstadt NPP	Zwilag	PSI	Gösgen NPP	Mühleberg NPP
Date and time	First half	First half	First half	Second half	Second half	Second half
2025	PEE	PEE	PEE	IEE	SEE	PEE**
2026	GEE	PEE/P	PEE/F	IEE	PEE	PEE**
2027	PEE	PEE	PEE*	IEE	PEE/P	PEE**
2028	SEE	GEE	PEE	IEE	PEE	PEE**
2029	PEE/F	PEE	PEE	IEE	PEE/F	PEE**
2030	PEE	PEE	SEE	IEE/F	GEE	PEE**
2031	PEE/P	SEE	PEE	SEE	PEE	PEE/F**
2032	GEE	PEE/F	PEE	IEE	PEE	PEE**
2033	PEE	PEE	PEE	IEE	SEE	PEE**
2034	PEE	GEE	PEE/F	IEE	PEE	PEE**

* Scenario that requires protection measures in the special PSI/ZZL hazard zone as per the Emergency Preparedness Ordinance

** Subject to the state of the installation at the time

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