



SAFETY BULLETIN IN CASE OF A CHEMICAL INCIDENT

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SAFETY BULLETIN IN CASE OF A CHEMICAL INCIDENT AT OLKILUOTO NUCLEAR POWER PLANT



— The danger zone where chemicals are stored and used is within the power plant site.

TVO is committed to safety culture of a high standard. In all its operations, TVO takes into account the nuclear safety of its nuclear power plants and all safety issues pertaining to its other operations.

Olkiluoto nuclear power plant has since 2012 been considered a plant that based on the chemicals stored and used onsite is required to prepare a safety report. The safety report referred to in Decree 685/2015 of the Finnish Government on the Industrial Handling and Storage of Dangerous Chemicals has been submitted to the Finnish Safety and Chemicals Agency (Tukes). The safety report and the related lists of chemicals are available for viewing at the main gate of the Olkiluoto nuclear power plant.

TVO has prepared this bulletin, designed for areas near the power plant, which describes the operation of the power plant, defines the risks caused by the operation and provides instructions on action in case of any incidents in order to avoid and minimise damage.

A separate bulletin as well as instructions have been prepared regarding potential radiation accidents. These can be found on the websites of the Municipality of Eurajoki, the Town of Rauma, TVO, and Satakunta Rescue Department. The bulletin has also been distributed within the emergency planning zone of the Olkiluoto nuclear power plant.

Olkiluoto nuclear power plant

Olkiluoto nuclear power plant consists of plant units OL1 and OL2. They are boiling water type light water reactors, each with a net electrical output of ca. 890 MW. The combined annual electricity production of the plant units is ca. 14 TWh.

The new nuclear power plant unit OL3 is a pressurised water reactor. The electrical output of the OL3 plant unit is about 1,600 MW and it will produce ca. 13 TWh of electricity per year. In addition to the actual energy production units, the power plant comprises an interim storage for spent nuclear fuel, interim storages and handling facilities for low and intermediate level waste, a final repository for operating waste and water treatment plants. A boiler plant is provided for backup heat production in the power plant site area. Posiva Oy's final disposal facility ONKALO® for spent nuclear fuel as well as Fingrid Oy's gas turbine power plant are also located in Olkiluoto, outside the power plant site area.

TVO has a certified Integrated Management System in place. The Company's Quality Management System complies with the ISO 9001 standard. The Environmental System meets the requirements of the ISO 14001 standard, the EMAS Regulation and the Energy Efficiency System. TVO also utilises a Health and Safety Management System which conforms to the requirements of the ISO 45001 standard.

Hazardous substances handled in Olkiluoto and potential incidents associated with them

Tukes has granted TVO permits for the storage and use of dangerous chemicals in the Olkiluoto area. Plants that store or use dangerous chemicals are required to prepare a safety report based on the quantities and properties of the substances. For the Olkiluoto power plant, the basis for the obligation to prepare the safety report is large-scale storage and use of dangerous chemicals.

The most important chemicals used at the plant, in terms of their dangerous properties as well as quantities stored and used, include an aqueous solution of hydrazine, diesel oil, petrol and hydrogen. The properties of these chemicals are specified in more detail in the Table on page 5.

In the hazard identification and risk assessment process, major spills and fires of the diesel oils and fuel oils used in emergency power generation, leaks and ignition of flammable gases, failures of hydrazine containers as well as fires in the locations where chemicals are used and stored were considered to be incidents with the most severe consequences.

Based on the identification of hazards and assessment of risks as well as preparedness, the dangerous chemicals stored and used on the Olkiluoto power plant site are not assessed to cause any major accident hazards. Any incidents involving people and property are restricted to the power plant site.

Preparedness efforts are taken to limit any adverse effects on the environment to the immediate vicinity of the power plant. Fires may cause strong production of smoke and black carbon emissions which contaminate the environment. Oils as well as firefighting water containing oil or chemicals may be released into water bodies as a consequence of a severe accident.

Preparedness for incidents and accidents

TVO and TVO's personnel are committed to safety culture of a high standard. In order to ensure safety, the nuclear safety of the nuclear facilities as well as the safety of production and operations, occupational and environmental safety, personnel safety, information security and the security of facilities, as well as rescue and emergency response activities are taken into account by TVO in all its operations.

TVO pays special attention to the safety knowledge of its own employees and that of the contractors operating in the power plant site area. The access card required to access the plant site area is only granted to persons who have completed TVO's induction training and the required safety training courses. Work tasks in the power plant site area may only be carried out by persons with the required competence. Safety training is provided to the personnel on a regular basis.









The operations and the safety of the Olkiluoto power plant are controlled by means of regular inspections carried out by e.g., nuclear and chemical safety authorities as well as TVO's own experts. Inspections of fire, chemical and environmental safety, and occupational health and safety as well as the audits required for the certification of the Integrated Management System are conducted at the power plant at regular intervals.

Internal rescue plans including guidelines for action in response to different types of accidents and hazards have been prepared for the Olkiluoto site area. TVO's plant fire brigade and first response unit are in charge of initial actions in case of accidents in the power plant site area. Upon arrival on the scene, the Satakunta Rescue Department takes over leadership of the situation as well as firefighting and rescue operations.







In case of an accident that could cause danger outside the plant site area, the Rescue Department will isolate the danger area and provide required instructions to the residents of nearby areas. The Rescue Department has prepared an external rescue plan in case of a chemical accident.



CHEMICALS DANGEROUS TO HEALTH AND THE ENVIRONMENT

| Chemical name | Dangerous properties | Effects on health and the environment | Identification of risk and risk preparedness |
|---------------|---|---|---|
| Hydrazine |  Toxic  Chronic health hazard  Corrosive  Dangerous to the environment | The 15% hydrazine solution used for deoxidation in the power plant's steam-water circulation to prevent corrosion is carcinogenic and toxic to the aquatic environment. | Spraying or spilling of hydrazine when injected into the process or as a result of transport damage to the hydrazine container (1 m ³). Handling in compliance with appropriate safety regulations. Any spills are handled in a controlled manner on the plant site. The plant fire brigade has the capability and the equipment needed for accident response. |
| Diesel oil |  Flammable  Harmful/irritant/sensitising/dangerous to ozone layer  Chronic health hazard  Dangerous to the environment | A liquid fuel which is carcinogenic and toxic to the aquatic environment. | Spill and ignition risk. Appropriate oil separation and drain system. Transfer from tanker truck to tank according to defined procedure and under supervision. Tanks are provided with a catch basin. The plant fire brigade has the capability and the equipment needed for accident response. |

FLAMMABLE AND EXPLOSIVE CHEMICALS

| Chemical name | Dangerous properties | Effects on health and the environment | Identification of risk and risk preparedness |
|---------------|---|--|--|
| Hydrogen |  Flammable  A gas under pressure | | A gas which is lighter than air and flammable. A hydrogen leak can cause an explosion and a hydrogen fire. The OL3 plant unit is equipped with hydrogen removal systems. In case of an incident, the area is isolated and action taken as instructed by the plant fire brigade. |
| Petrol |  Flammable  Harmful/irritant/sensitising/dangerous to ozone layer  Chronic health hazard  Dangerous to the environment | Carcinogenic and dangerous to the aquatic environment. | A highly volatile liquid fuel which may explode on contact with air. Spill and ignition risk. Appropriate oil separation and drain system. The plant fire brigade has the capability and the equipment needed for accident response. In case of ignition the area is isolated. |

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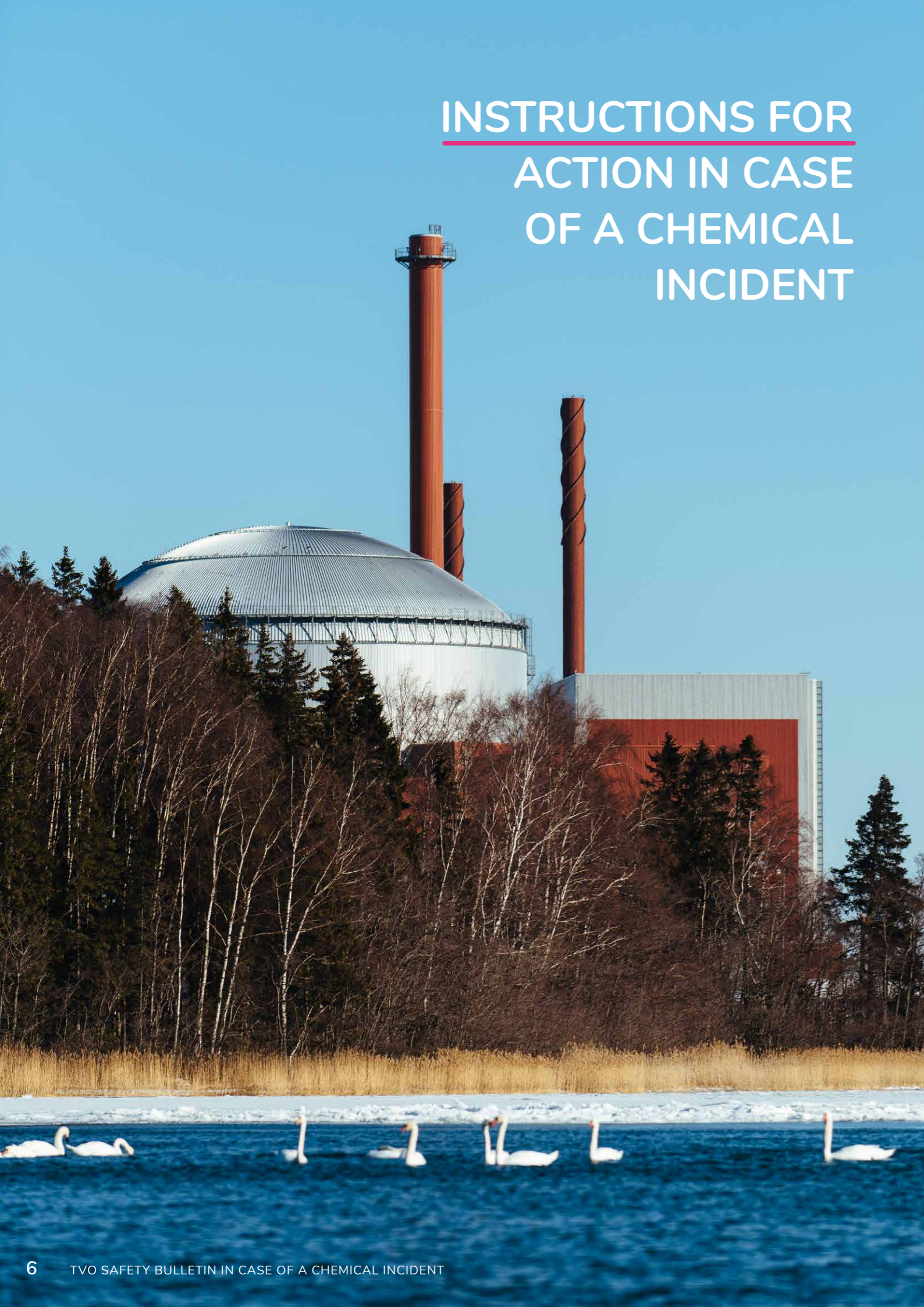
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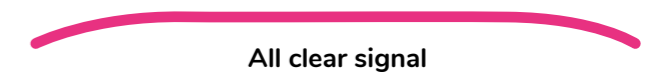
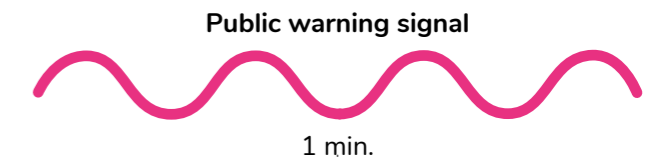
INSTRUCTIONS FOR ACTION IN CASE OF A CHEMICAL INCIDENT



The **public warning signal** is a one-minute long sound signal consisting of rising (7 seconds) and falling sequences (7 seconds), or a warning issued by the authorities using a public announcement system.

The **all clear signal** is a one-minute long continuous steady sound signal which indicates that the hazard or danger has passed.

The **test signal** is a seven-second long continuous steady sound signal.



Follow these instructions if you hear the public warning signal

1. Go indoors. Stay indoors.
2. Close doors, windows and air vents and shut down ventilation systems. Remember to turn off forced ventilation.
3. Follow the instructions broadcast on radio, television and online media of authorities. Instructions provided by authorities are shown on YLE text-TV pages 112 and 867-868. Further information is provided also on the websites and Twitter accounts of Satakunta Rescue Department, TVO and the Radiation and Nuclear Safety Authority of Finland (STUK):
www.satapelastus.fi / @Satapelastus
www.stuk.fi / @STUK_FI
www.tvo.fi / @tvo_fi
4. Avoid unnecessary communications (use of Internet, messaging and calling) so as not to block the important communication lines of the authorities.
5. Do not leave the area of your own volition unless instructed to do so by the authorities, to avoid potential risks on the way.



In a gas incident, follow the instructions listed above, and also:

- if you are indoors and you can smell gas, press some wet fabric against your mouth and breathe through it
- stay on upper levels of the building until the incident has passed – listen to the radio.



If you are outdoors and unable to go indoors:

- move crosswind and hurry away from under the gas cloud
- try to go to an elevation as high as possible, e.g., on top of a hill
- press some wet fabric, or a wad of grass, peat or moss against your mouth and breathe through it.



FOLLOW THE INSTRUCTIONS AND ORDERS ISSUED BY RESCUE AUTHORITIES IN AN ACCIDENT.

Wait for the authorities to announce the danger has passed. These instructions can also be found in the first pages of the telephone directory. For more information, please go to the website of the Finnish Rescue Services at www.pelastustoimi.fi.

A separate bulletin as well as instructions have been prepared regarding potential radiation accidents. These can be found on the websites of the Municipality of Eurajoki, the Town of Rauma, TVO, and Satakunta Rescue Department. The bulletin has also been distributed in the economic area of Rauma.



Public emergency warnings are also sent to your phone if you have installed the 112 Suomi app and allowed the app to share your location. This will allow you to receive the warnings also in a location where the public warning signal is not audible. The app provides instructions for different types of incidents. The app can be downloaded free of charge from app stores.



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