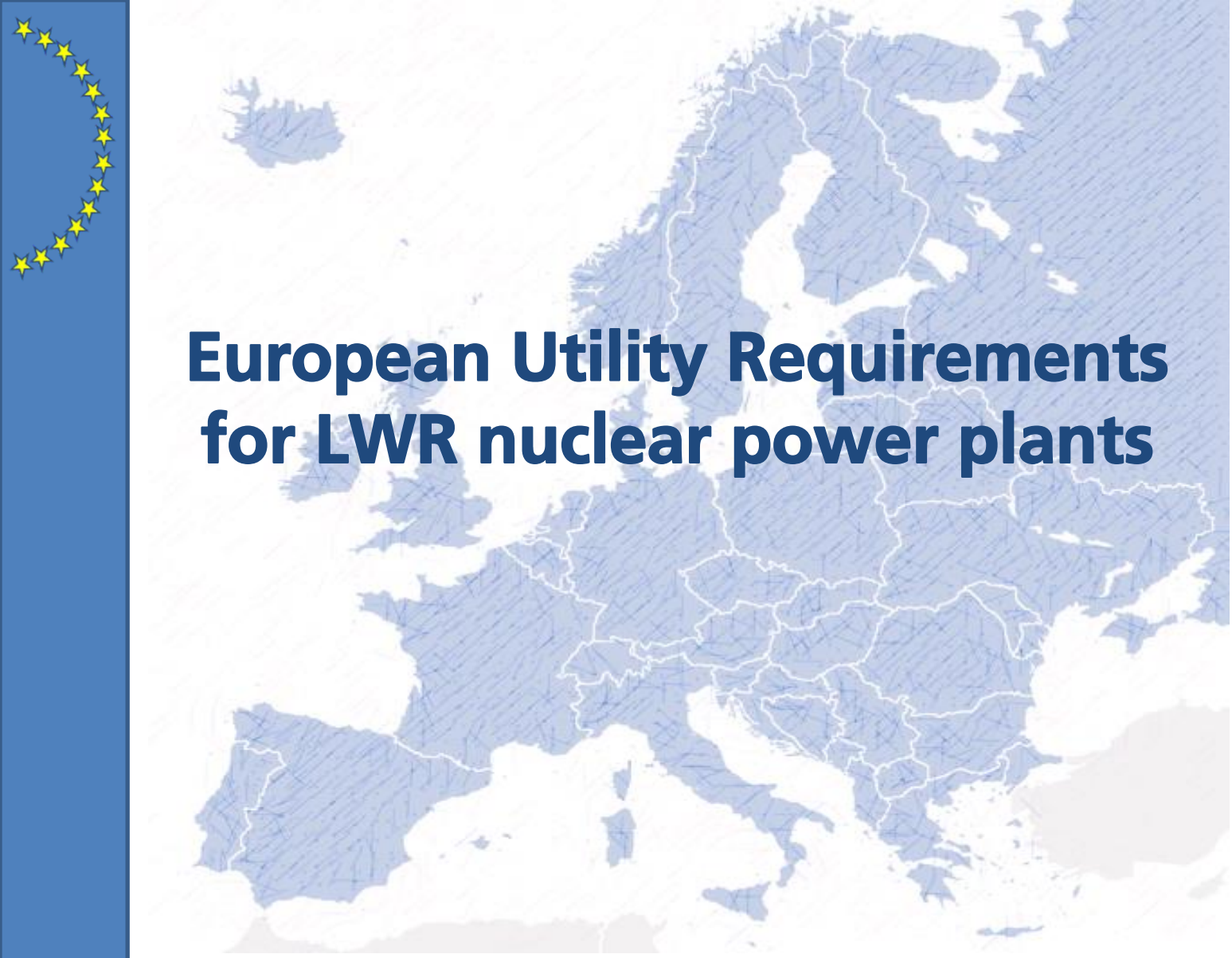


European Utility Requirements for LWR nuclear power plants

To address Climate Change threats, a balanced low carbon energy mix, including nuclear, is essential in Europe. The EUR organisation aims to be the voice of European nuclear Utilities influencing the design of future NPP to be built in Europe and worldwide, through harmonised requirements and assessments, and strong interactions with vendors and regulatory bodies, contributing to safe, competitive, licensable nuclear New Build projects in Europe.

The EUR Organisation

Objectives of the EUR Organisation

Harmonised and standardised requirements

The European Utilities involved in the production of the EUR Document aim at harmonisation and stabilisation of the requirements to which LWR NPPs to be built in Europe will be designed, built, commissioned, operated and maintained. Harmonisation of requirements and standardisation of designs are of benefit to the safety and performance of these large-scale industrial projects. By applying these same rules across a wide geographical area and market it should be sufficient to attract designers to follow them.

A basis for designing a standard plant

A major objective of the EUR Utilities through the EUR document is to provide the basis for designing standard Nuclear Islands which can be licensed, built and operated in the majority of European countries with only minor variations, using a standard safety case and Standard Design studies. This will lead to increased competitiveness by allowing the development of a Standard Design, thus establishing conditions for fair competition between vendors, as well as between the electricity producers.
Standardisation is cost effective since it allows the cost of developing and launching a new design to be spread over a number of plants. In addition, series ordering and manufacture of plant and equipment should result in significant cost savings.
Following this objective, the aim of the EUR requirements is to promote the harmonisation of safety approaches, targets, criteria and assessment methods; the Design conditions; the Design objectives and criteria for the main systems and equipment; the equipment specifications and standards; and the information required for the assessment of safety, reliability and cost.

Keep strong interactions with other stakeholders

In this context, another major objective of the EUR organisation is to keep strong interactions with other important stakeholders in Europe and worldwide such as EC, WENRA, OECD, IAEA, ENISS, CORDEL.

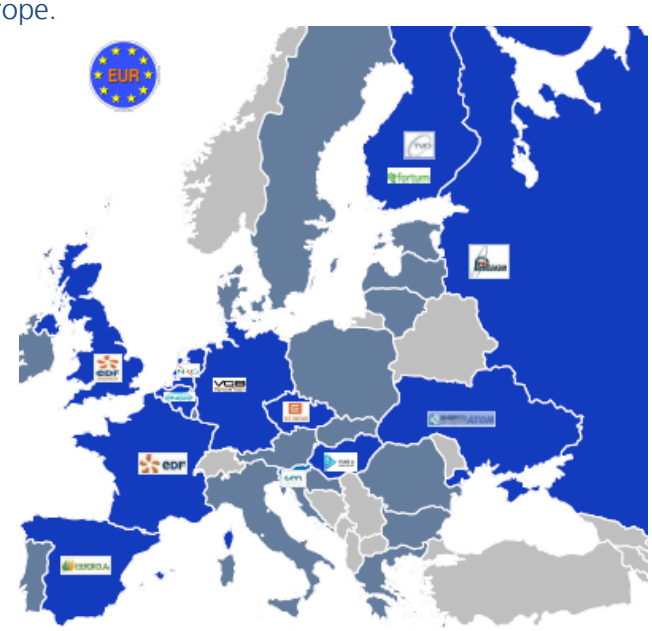
Provide regular seminars, workshop or training courses

In order to develop and strengthen the state-of the art knowledge of advanced reactors and synthesising major stakeholders requirements related to GEN 3, seminars, workshops, or training courses are to be held on a regular basis with the involvement of the most experienced nuclear experts from Europe providing a useful opportunity for specialists of existing utilities as well as new-comers to keep their knowledge up to date.

EUR Members

The EUR organisation was created in 1991. In 2019, it is composed of 13 companies involved in electricity generation from nuclear power in Europe.

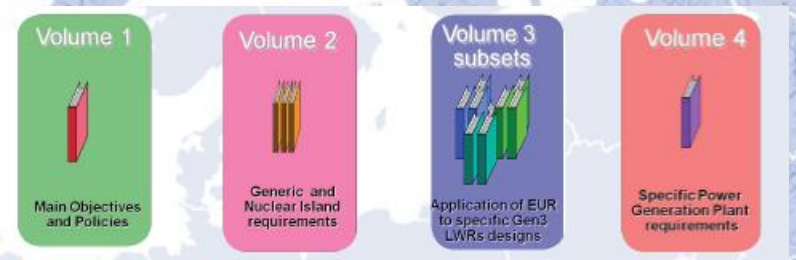
CEZ	(Czech Republic)
EDF	(France)
EDF Energy	(United Kingdom)
ENERGOATOM	(Ukraine)
FORTUM	(Finland)
ENGIE/TRACTEBEL	(Belgium)
GEN energija	(Slovenia)
IBERDROLA	(Spain)
PAKS II	(Hungary)
NRG	(Netherlands)
ROSENERGOATOM	(Russia)
TVO	(Finland)
VGB PowerTech	(Germany)



The EUR Document

Content of the EUR Document

The EUR Document covers the entire plant up to the grid interface. It is therefore the basis for an integrated plant design (i.e. Nuclear Island and Power Generation Plant). It emphasises those areas which are most important to the objective of achieving a Generation III NPP which is optimised with respect to safety, performance, constructability and economics. The requirements are grounded in proven technology from 45 years of commercial European and international LWR experience.
The EUR Document currently includes 4 volumes:



Volume 1: This volume contains main EUR Policies & Objectives; the list of Acronyms; the list of Definitions and the EUR Key Issues which provide a high level overview of the EUR Document.

Volume 2: This volume contains design-neutral requirements and preferences of the EUR utilities for a nuclear island. The EUR policy is to have a core of strong generic requirements expressed as objectives or functions as far as possible. Many of these requirements are kept open, i.e. they provide only a design methodology and objectives that can be implemented in several ways by the Plant Designer, and others are defined in order to give guidance to Designers.
Volume 2 contains twenty chapters which aim to tackle specific topics related to plant design and construction. Together they cover the whole scope of the activities that are necessary in order to design, licence, build, test and operate a Nuclear Island together with some of the related site facilities.

Volume 3: This volume consists of a number of subsets. Each subset is dedicated to a specific design that is of interest to the participating Utilities. It contains a description of a standard Nuclear Island, a summary of the analysis of compliance against EUR Volumes 2 and 4, and, where needed, design dependent requirements and preferences of the EUR Utilities. This information is proprietary and only available subject to vendor agreement and signature of a Non-Disclosure Agreement.

Volume 4: This volume contains specific requirements related to the Power Generation Plant.

The EUR Document in a few Figures

16
EUR utilities & about 100 experts involded in the writing process

30
chapters & about 1500 pages

5500
requirements for new GEN III LWR Nuclear Power Plants (PWR and BWR)

Revision C
published in April 2001

Revision D
published in October 2012

Revision E
published in December 2016

The EUR Assessments of new Designs

Designers or vendors of Nuclear Power Plants can apply for an assessment of one of their designs against the current revision of the EUR Document. The result of each specific design assessment is one subset of the Volume 3 of the EUR Document. The Designer has to apply formally for an assessment of one of its designs and has to present its strategy regarding the European market and to commit to provide accurate and detailed information, to get this information accessible from the beginning of the assessment work to the assessors (i.e. language, conditions of use, specific agreement needed, etc.) and to allocate dedicated resources to explain the design features.
The design shall be a LWR plant and its level of development shall be sufficient to allow a detailed assessment of compliance against the EUR Document Volumes 2 and 4.

Since the EUR organisation was created, design assessments (EUR Document Volume 3 subsets) of various designs have been performed against the EUR requirements:

- → 5 designs assessed against revision B: BWR90, EPP, EPR, ABWR, SWR1000
- → 3 designs assessed against revision C: AP1000, VVER AES 92, STD EPR
- → 3 designs assessed against revision D: EU-APWR, EU-APR, VVER TOI

The design assessment against revision E: of the EU-HPR 1000 is on-going.

For further information, please contact:
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