



# EUROPEAN UTILITY REQUIREMENTS FOR LWR NUCLEAR POWER PLANTS

## VOLUME 1 MAIN POLICIES AND OBJECTIVES

### APPENDIX A - ACRONYMS

*Revision E  
December, 2016*

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**APPENDIX A – ACRONYMS**

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**Acronym** *Meaning***A**

<b>AAA</b>	Average Annual Availability
<b>AC</b>	Alternating Current
<b>ACC</b>	Air Craft Crash
<b>ACF(S)</b>	Acid Feeding (System)
<b>ACI</b>	American Concrete Institute (USA)
<b>ACW(S)</b>	Auxiliary Circulating Water (System)
<b>AD</b>	Arbeitsgemeinschaft Druckbehälter Merkblätter (Germany)
<b>ADS</b>	Automatic Depressurisation System
<b>AENOR</b>	Asociacion Española de Normalizacion y Certificacion (Spain)
<b>AFCEC</b>	Association Française pour la Construction et le Contrôle des Matériels Conventionnels des Centrales Electronucléaires (France)
<b>AFCEN</b>	Association Française pour la Conception et la Construction des Chaudières Electronucléaires (France)
<b>AFNOR</b>	Association Française de Normalisation (France)
<b>AFW(S)</b>	Auxiliary Feedwater (System)
<b>AICC</b>	Adiabatic Isochoric Complete Combustion
<b>AIF</b>	Atomic Industrial Forum (USA)
<b>ALARA</b>	As Low As Reasonably Achievable
<b>ALARP</b>	As Low As Reasonably Practicable
<b>ALWR</b>	Advanced Light Water Reactor
<b>ANS</b>	American Nuclear Society (USA)
<b>ANSI</b>	American National Standards Institute (USA)
<b>ANT</b>	Auxiliary Normal Transformer
<b>AOO</b>	Anticipated Operation Occurrences
<b>AOP</b>	Abnormal Occurrence Procedures
<b>ASME</b>	American Society of Mechanical Engineers (USA)
<b>AS(S)</b>	Auxiliary Steam (System)
<b>ASSET</b>	Analysis of Safety Significant Event Team



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<b><i>Acronym</i></b>	<b><i>Meaning</i></b>
<b>AST</b>	Auxiliary Standby Transformer
<b>ASTM</b>	American Society for Testing and Materials (USA)
<b>ATWS</b>	Anticipated Transient Without Scram
<b>ATWT</b>	Anticipated Transient Without Trip
<b>AVR</b>	Automatic Voltage Regulator



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**Acronym** *Meaning***B**

<b>BOP</b>	Balance Of Plant
<b>BP</b>	Break Preclusion
<b>BP/LBB</b>	Indicate either the Break Preclusion (BP) or the Leak Before Break (LBB) concept
<b>BS</b>	British Standards (UK)
<b>BSS</b>	Basic Safety Standard
<b>BTP</b>	Branch Technical Positions (USA)
<b>BWR</b>	Boiling Water Reactor



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**Acronym** *Meaning***C**

<b>CAD</b>	Computer Aided Design
<b>CA(S)</b>	Chemical Addition (System)
<b>CCCD</b>	Corium Collecting and Cooling Device
<b>CCF</b>	Common-Cause Failure
<b>CCW(S)</b>	Component Cooling Water (System)
<b>CDF</b>	Core Damage Frequency
<b>CDWS</b>	Chilled Water System
<b>CEC</b>	Commission of the European Communities
<b>CEN</b>	Comité Européen de Normalisation (Europe)
<b>CFR</b>	Code of Federal Regulations (USA)
<b>CHEI(S)</b>	Chemical Injection (System)
<b>CHR(S)</b>	Containment Heat Removal (System)
<b>CI</b>	Conventional Island
<b>CIS</b>	Chemical Injection System
<b>CLI</b>	Criterion for Limited Impact
<b>CMT</b>	Core Make-up Tank
<b>CODAP</b>	Code Français de Construction des Appareils à Pression (France)
<b>COMA(S)</b>	Compressed Air (System)
<b>COMG(S)</b>	Compressed Gas (System)
<b>CPR</b>	Critical Power Ratio
<b>CQC</b>	Complete Quadratic Combination
<b>CRD (M)</b>	Control Rod Drive (Mechanism)
<b>CRDC(S)</b>	Control Rod Drive Cooling (System)
<b>CSA(S)</b>	Chemical Sampling (System)
<b>CSMU(S)</b>	Condensate Storage and Make-Up (System)
<b>CS(S)</b>	Containment Spray (System)



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<i>Acronym</i>	<i>Meaning</i>
CSN	Consejo Seguridad Nuclear (Spain)
CVC(S)	Chemical and Volume Control (System)



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<b>Acronym</b>	<b>Meaning</b>
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**D**

<b>DBA</b>	Design Basis Accident
<b>DBC</b>	Design Basis Condition
<b>DBE</b>	Design Basis Earthquake
<b>DBEH</b>	Design Basis External Hazard
<b>DBF</b>	Design Basis Fault
<b>DC</b>	Direct Current
<b>DCH</b>	Direct Containment Heating
<b>DCS</b>	Distributed Control System
<b>DEC</b>	Design Extension Conditions
<b>DEGF</b>	Double Ended Guillotine Failure
<b>DF</b>	Decontamination Factor
<b>DiD</b>	Defence-in-Depth
<b>DIN</b>	Deutsches Institut für Normung (Germany)
<b>DMS</b>	Document Management System
<b>DNB(R)</b>	Departure from Nucleate Boiling (Ratio)
<b>DOF</b>	Degree Of Freedom
<b>DVI</b>	Direct Vessel Injection
<b>DWS</b>	Demineralised Water System
<b>DWST(S)</b>	Demineralised Water Storage and Transfer (System)



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<b>Acronym</b>	<b>Meaning</b>
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**E**

<b>EC</b>	European Community
<b>ECC(S)</b>	Emergency Core Cooling (System)
<b>ECM</b>	Enterprise Content Management
<b>ECR</b>	Emergency Control Room
<b>EFB</b>	Elementary Functional Block
<b>EFPD</b>	Effective Full Power Day
<b>EFL</b>	European Federation of Lifting
<b>EFW(S)</b>	Emergency Feed Water (System)
<b>EHV</b>	Extra High Voltage or Extremely High Voltage
<b>ELAP</b>	Extended Loss of all AC Power
<b>ELP(S)</b>	Electrical Protection (System)
<b>EMC</b>	Electro-Magnetic Compatibility
<b>EMI</b>	Electro-Magnetic Interferences
<b>EN</b>	Euronorm (European Standard)
<b>ENTSO-E</b>	European Network of Transmission System Operators for Electricity
<b>EOP</b>	Emergency Operating Procedure
<b>EPG</b>	Emergency Procedure Guidelines
<b>EPRI</b>	Electric Power Research Institute (USA)
<b>ERL</b>	Emergency Reference Level
<b>ESW(S)</b>	Essential Service Water (System)
<b>EU</b>	European Union
<b>EUR</b>	European Utility Requirements
<b>EURATOM</b>	Organisation Atomique Européenne
<b>EUROVENT</b>	European Committee of the Constructors of Airhandling Equipment
<b>EX(S)</b>	Excitation (System)



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<b>Acronym</b>	<b>Meaning</b>
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**F**

<b>FA</b>	Fuel Assembly
<b>FAT</b>	Factory Acceptance Test
<b>FDP</b>	Final Decommissioning Plan
<b>FEM</b>	Fédération Européenne de Manutention (European Federation of Handling)
<b>FIRP(S)</b>	Fire Protection (System)
<b>FMEA</b>	Failure Mode and Effects Analysis
<b>FOAKE</b>	First Of A Kind Engineering
<b>FP</b>	Fission Product
<b>FPC(S)</b>	Fuel Pool Cooling (System)
<b>FPGA</b>	Field-Programmable Gate Array
<b>FSH(S)</b>	Fuel Storage and Handling (System)
<b>FSM</b>	Frequency Sensitive Mode
<b>FW</b>	Feed Water
<b>FWLB</b>	Feed Water Line Break



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**Acronym**

**Meaning**

### **G**

<b>GCB</b>	Generator Circuit Breaker
<b>GEXC(S)</b>	Generator Excitation Control (System)
<b>GPRO(S)</b>	Generator Protection (System)
<b>GSPC(S)</b>	Generator Speed and Power Control (System)
<b>GS(S)</b>	Gland Sealing (System)
<b>GT</b>	Generator Transformer



**APPENDIX A – ACRONYMS**

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**Acronym** *Meaning***H**

<b>HC(S)</b>	Hydrogen Cooling (System)
<b>HELB</b>	High Energy Line Break
<b>HEP</b>	Human Error Probabilities
<b>HEPA</b>	High Efficiency Particulate Air (filter)
<b>HHSI</b>	High Head Safety Injection
<b>HMI(S)</b>	Human-Machine Interface (System)
<b>HP</b>	High Pressure
<b>HRA</b>	Human Reliability Analysis
<b>HV</b>	High Voltage
<b>HVAC(S)</b>	Heating, Ventilation and Air Conditioning (System)
<b>HX</b>	Heat Exchanger



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**Acronym****Meaning****I**

<b>I&amp;C</b>	Instrumentation and Control
<b>IAEA</b>	International Atomic Energy Agency
<b>IASCC</b>	Irradiation Assisted Stress Corrosion Cracking
<b>ICRP</b>	International Commission on Radiological Protection
<b>IDC</b>	Interest During Construction
<b>IDP</b>	Initial Decommissioning Plan
<b>IEC</b>	International Electrotechnical Commission
<b>IEEE</b>	Institute of Electrical and Electronics Engineers (USA)
<b>IFB</b>	Institut für Bautechnik (Germany)
<b>IGSCC</b>	Inter Granular Stress Corrosion Cracking
<b>ILRT</b>	Integrated Leak Rate Test
<b>IMS</b>	Information Management System
<b>INPO</b>	Institute of Nuclear Power Operations (USA)
<b>INSAG</b>	International Nuclear Safety Advisory Group (IAEA)
<b>IP</b>	Intermediate Pressure
<b>IPPC</b>	Integrated Pollution Prevention and Control
<b>IRS</b>	Incident Reporting System
<b>IRWST</b>	In-containment Refueling Water Storage Tank
<b>ISI</b>	In Service Inspection
<b>ISIS</b>	Innovative Systems Integral Safety (Germany)
<b>ISO</b>	International Organisation for Standardisation
<b>IVR</b>	In-Vessel Retention



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<b>K</b>	
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<b>KTA</b>	Kerntechnischer Ausschuss (Germany)
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<i>Acronym</i>	<i>Meaning</i>
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<b>L</b>	
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<b>LBB</b>	Leak Before Break
<b>LBLOCA</b>	Large Break LOCA
<b>LCO</b>	Limiting Conditions for Operation
<b>LFSM - O</b>	Limited Frequency Sensitive Mode - Overfrequency
<b>LFSM - U</b>	Limited Frequency Sensitive Mode - Underfrequency
<b>LGN(S)</b>	Lightning Protection (System)
<b>LHSI</b>	Low Head Safety Injection
<b>LOCA</b>	Loss of Coolant Accident
<b>LOOP</b>	Loss Of Off-site Power
<b>LP</b>	Low Pressure
<b>LSP</b>	Lighting and Small Power Systems
<b>LV</b>	Low Voltage
<b>LWR</b>	Light Water Reactor



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**Acronym**                      *Meaning***M**

<b>MCR</b>	Main Control Room
<b>MCW(S)</b>	Main Circulating Water (System)
<b>MF(S)</b>	Main Feed Water (System)
<b>MFB</b>	Macro Functional Blocs
<b>MFIV</b>	Main Feedwater Isolation Valve
<b>MFLB</b>	Main Feed Line Break
<b>MG(S)</b>	Main Generator (System)
<b>MHSI</b>	Medium Head Safety Injection
<b>MOV</b>	Motor-Operated Valve
<b>MOX</b>	Mixed Oxide Fuel (partly Pu mixed)
<b>MPDR</b>	Maximum Permissible Dose Rate
<b>MSGTR</b>	Main Steam Generator Tube Rupture
<b>MSIV</b>	Main Steam Isolation Valve
<b>MSLB</b>	Main Steam Line Break
<b>MSR</b>	Moisture Separator Reheater
<b>MSSE(S)</b>	Main Steam Supply and Extraction (System)
<b>MTBF</b>	Mean Time Between Failures
<b>MTG(S)</b>	Main Turbine Generator (System)
<b>MTTR</b>	Mean Time To Repair
<b>MV</b>	Medium Voltage
<b>MWTP</b>	Make-up Water Treatment Plant



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**Acronym                      Meaning****N**

<b>NDT</b>	Non Destructive Testing
<b>NEA</b>	Nuclear Energy Agency
<b>NI</b>	Nuclear Island
<b>NPP</b>	Nuclear Power Plant
<b>NPSH</b>	Net Positive Suction Head
<b>NRHS</b>	Normal Residual Heat Removal System
<b>NRLW(S)</b>	Non Radioactive Liquid Waste (System)
<b>NSSS</b>	Nuclear Steam Supply System
<b>NUMARC</b>	Nuclear Management And Resource Council
<b>NUREG</b>	Nuclear Regulatory (a series of USNRC reports)
<b>NUSS</b>	Nuclear Safety Standards (IAEA)



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<b>Acronym</b>	<b>Meaning</b>
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**O**

<b>OBE</b>	Operating Basis Earthquake
<b>ODAF</b>	Oil Directed Air Forced
<b>ODSCC</b>	Outer Diameter initiated Stress Corrosion Cracking
<b>ODWF</b>	Oil Directed Water Forced
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>OFAF</b>	Oil Forced Air Forced
<b>OLCC(S)</b>	On-load Condenser Cleaning (System)
<b>ONAN</b>	Oil Natural Air Natural
<b>ORE</b>	Occupational Radiation Exposure
<b>OSART</b>	Operational Safety Review Team (IAEA)
<b>OSE</b>	Operational Shutdown Earthquake



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**Acronym****Meaning****P**

<b>P&amp;ID</b>	Piping and Instrumentation Diagram
<b>PAM</b>	Performance Assessment Methodology
<b>PCI</b>	Pellet-Clad Interaction
<b>PE(S)</b>	Plant Earthing (System)
<b>PGP</b>	Power Generation Plant
<b>PIE</b>	Postulated Initiating Event
<b>PIN</b>	Project Information Network
<b>PLiM</b>	Plant Life Management
<b>PM</b>	Preventive Maintenance
<b>PORV</b>	Power-Operated Relief Valve
<b>PRHRS</b>	Passive Residual Heat Removal System
<b>PRMS</b>	Process Radiation Monitoring System
<b>PRT</b>	Pressurizer Relief Tank
<b>PRZ</b>	Pressurizer
<b>PSA</b>	Probabilistic Safety Assessment
<b>PSD</b>	Power Spectral Density
<b>PSIS</b>	Passive Safety Injection System
<b>PVC</b>	Poly Vinyl Chloride
<b>PWR</b>	Pressurised Water Reactor



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### Q

QA(P)	Quality Assurance (Programme)
QC	Quality Control



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**Acronym****Meaning****R**

<b>RC(S)</b>	Reactor Coolant (System)
<b>RCC</b>	Règles de Conception et de Construction des Centrales Electronucléaires (Design and Construction Rules for Nuclear Power Plants - France)
<b>RCCA</b>	Rod Cluster Control Assembly
<b>RCCM</b>	Règles de Conception et de Construction des Matériels Mécaniques
<b>RCM</b>	Reliability Centered Maintenance
<b>RCP</b>	Reactor Coolant Pump
<b>RCPB</b>	Reactor Coolant Pressure Boundary
<b>RCSL</b>	Reactor Control Surveillance and Limitation
<b>RECO(S)</b>	Recombiner (System)
<b>RfG</b>	European Code "Requirements for Generators"
<b>RFS</b>	Règles Fondamentales de Sûreté (France)
<b>RG</b>	Regulatory Guides (USA)
<b>RHR(S)</b>	Residual Heat Removal (System)
<b>RIM</b>	Required Input Motion
<b>RPS</b>	Reactor Protection System
<b>RPV</b>	Reactor Pressure Vessel
<b>RSEH</b>	Rare and Severe External Hazard
<b>RSEM</b>	Règles de Surveillance en Exploitation des Matériels Mécaniques des îlots nucléaires (France)
<b>RSK</b>	Reaktor Sicherheits-Kommission (Germany)
<b>RST</b>	Reference Source Term
<b>RV</b>	Reactor Vessel
<b>RWCUS</b>	Reactor Water CleanUp System
<b>RWP(S)</b>	Radioactive Waste Processing (System)
<b>RW(S)</b>	Raw Water (System)
<b>RWST</b>	Refuelling Water Storage Tank



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**Acronym** *Meaning***S**

<b>SAMG</b>	Severe Accident Management Guidelines
<b>SASS</b>	Severe Accident Safe State
<b>SBLOCA</b>	Small Break LOCA
<b>SBO</b>	Station Black Out
<b>SCC</b>	Stress Corrosion Cracking
<b>SCS</b>	Significant Contribution to Safety
<b>SD(S)</b>	Safety Depressurisation (System)
<b>SFC</b>	Single Failure Criterion
<b>SFP</b>	Spent Fuel Pool
<b>SG</b>	Steam Generator
<b>SGBD</b>	Steam Generator Blowdown
<b>SGB(S)</b>	Steam Generator Blowdown (System)
<b>SGECS</b>	Steam Generator Emergency Cooldown System
<b>SGTR</b>	Steam Generator Tube Rupture
<b>SHDS</b>	Shut Down System
<b>SI(S)</b>	Safety Injection (System)
<b>SIT</b>	Structural Integrity Test
<b>SLB</b>	Steam Line Break
<b>SLCS</b>	Stand-by Liquid Control System
<b>SMA(P)</b>	Seismic Margin Assessment (Programme)
<b>SNE</b>	Sociedad Nuclear Espanola (Spain)
<b>SRDF</b>	Système de Recueil de Données de Fiabilité
<b>SRSS</b>	Square Root Sum of Square
<b>SS</b>	Stainless Steel
<b>SSCs</b>	Structures, Systems and Components
<b>SSE</b>	Safe Shutdown Earthquake



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<i>Acronym</i>	<i>Meaning</i>
SSK	Strahlenschutz Kommission (Germany)
SSS	Safe Shutdown State



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**Acronym** *Meaning***T**

<b>TAF</b>	Top of Active Fuel
<b>TBCCW(S)</b>	Turbine Building Component Cooling Water (System)
<b>TCIC</b>	Total Capital Investment Cost
<b>TDFWP</b>	Turbine Driven Feedwater Pump
<b>TEMA</b>	Tubular Exchanger Manufacturers Association (USA)
<b>TOC</b>	Total Organic Carbon
<b>TSC</b>	Technical Support Centre
<b>TSO</b>	Transmission System Operator
<b>TWCC</b>	Through Wall Critical Crack



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### U

<b>UCTE</b>	Union for the Coordination of Transmission of Electricity
<b>UHS</b>	Ultimate Heat Sink
<b>UNE</b>	Una Norma Española (Spain)
<b>URD</b>	Utility Requirements Document (EPRI)
<b>USNRC</b>	United States Nuclear Regulatory Commission (USA)
<b>UT</b>	Ultrasonic Test



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### V

<b>V&amp;V</b>	Verification and Validation
<b>VCT</b>	Volume Control Tank
<b>VDE</b>	Verband Deutscher Elektrotechniker (Germany)
<b>VDI</b>	Verein Deutscher Ingenieure (Germany)



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<i>Acronym</i>	<i>Meaning</i>
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### W

<b>WANO</b>	World Association of Nuclear Operators
<b>WC(S)</b>	Water Chemistry (System)
<b>WENRA</b>	Western European Nuclear Regulators Association
<b>WSD</b>	Working Stress Design
<b>WT(S)</b>	Water Treatment (System)



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<i>Acronym</i>	<i>Meaning</i>
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<b>Z</b>	
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<b>ZPA</b>	Zero Period Acceleration
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