

RIENTEC



Zwentendorf Nuclear Power Plant Training (ZNPPT)



Conducted
by
RIENTEC
Vienna, Austria

We provide Nuclear Power Plant Training (NPPT) program at Zwentendorf Nuclear Power Plant to nuclear engineering students/nuclear workforce. The ZNPPT program is designed to bring a group of nuclear engineering experts from research, academia and the industry to deliver a unique and robust program. The NPPT program is based on a multi-tier approach:

1

CLASSROOM LECTURES DELIVERED BY UNIVERSITY PROFESSORS, NUCLEAR INDUSTRY EXPERTS AND STAFF FROM THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA);

2

HANDS ON TRAINING AT THE ZWENTENDORF NUCLEAR POWER PLANT (ZNPP); AND

3

EXPERIENTIAL LEARNING CONSISTING OF INTERACTIONS WITH INDUSTRY LEADERS.

NPPT will provide students with a unique experience by providing full and unrestricted access to the ZNPP. The plant is situated in the picturesque countryside of Tullnerfeld, Austria, a 45-minute drive from the capital Vienna. The plant was built in 1978, was ready to operate, but was never commissioned nor fueled due to a policy decision of the Austrian Government.

As a one-of-a-kind facility, it allows unrestricted access to all parts of the plant including the reactor itself.



Provided By
RIENTEC GmbH

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The centre provides comprehensive training in management, operation, maintenance and technical support necessary to develop a highly skilled workforce for a Nuclear Power Plant (NPP) and as such is often used as a training centre for the IAEA, European Commission (EURATOM), the United States Nuclear Regulatory Commission and regulators / operators from various countries.



SCOPE AND APPROACH FOR THE TRAINING

The ZNPPT program will provide fundamental nuclear education and training for up to 25 participants.

The scope of this training is intended to complement academic work with classroom seminars, group discussions, walk-downs in the plant and having access to various NPP structures, systems and components and, primarily put learning into practice at the ZNPP.

OBJECTIVES

The objective of the training program is to offer radiation free hands-on access to various plant components / structures / systems and develop nuclear acumen among participants through training modules and workshops.

The training modules at Zwentendorf NPP provide opportunity for:

- Understanding of activities associated with various stages of nuclear power plant through which it has to pass to see daylight
- Learning of internationally accepted provisions for nuclear safety, nuclear security, safeguards and obligations
- Access to various NPP structures, systems and components
- Understanding the functioning of various electrical, mechanical and instrumentation & control systems and associated troubleshooting

OBJECTIVES (Continued)

- Understanding of various engineering safety features for ensuring nuclear, fire, physical and industrial safety at NPP and provisions for precluding any breach to nuclear security.
- Understanding the licensing methodology and procedures for various stages of NPP and principles of quality assurance and technology management
- Understanding of activities of regulatory body, inspection methodology and associated procedures
- Understanding of role of emergency preparedness and safety culture for ensuring NPP safety
- Understanding of active safeguards provisions and additional protocols by International Atomic Energy Agency in member states

Technical Management

Professor Helmut BÖCK

Engineer Otmar PROMPER

Dr. Kaluba CHITUMBO (Coordinator of the Programme)

(The CVs are included in this brochure)

Instructors

The ZNPPT is resourced by some of the finest members in the nuclear industry consisting of academia, practitioners, and staff at agencies such as EURATOM and the IAEA.

We bring subject matter experts for each of the modules and provide full-time resources for each course throughout the period of training.

Administration and Liaison

Ms. Marie-Pierre JOVIN

IT Support

Mr. Isaac JONES

TRAINING COSTS

Training costs will be calculated on case by case basis depending on the specific requirements of the client. For details, contact Rientec: email: info@rientec.com, Tel.No. +43(0)6769319989 & +43(0)6603477124

TRAINING PROGRAMME

1. Training programme consists of the training modules listed on pages 5 through 8, and one day technical visits presented on page 9.
2. Training Schedule at ZNNPT: ZNNP is open for training from 15 March to end 31 October.
3. Sessions are conducted from Monday to Friday between 0800 and 1600 hrs.

TRAINING MODULES

The duration of the course would depend on the specific requirements of the client and could be tailored to the specific needs.

Outline of Training Modules

COURSE NAME	DESCRIPTION OF THE COURSE	SPECIFIC TOPICS	PLANT WALKDOWN
1. Site Selection	Introduction to site selection process	<ul style="list-style-type: none"> ■ Planning of site selection activities, Work control and site evaluation, ■ Data collection and evaluation, report preparation and site finalization 	Identify and explain the features relevant/important to site selection and safety aspects.
	Basic requirements for site selection and study of siting activities	<ul style="list-style-type: none"> ■ Geotechnical, Geological, Hydro-geological, Seismicity and Meteorological studies, ■ External Events due to Natural Phenomena - ■ Earthquakes and Surface Faulting, Geological Hazards, Meteorological, Flooding, Shoreline and Riverbank Erosion 	
	Impact of external events	<ul style="list-style-type: none"> ■ Human induced external events - Aircraft Crash, Chemical Explosion etc. 	
	NPP Radiological impact study	<ul style="list-style-type: none"> ■ Activity dispersion through atmospheric pathways, ■ Activity dispersion through surface water, ■ Radiation dose evaluation 	A visit to the IAEA Emergency Preparedness Center
	Emergency preparedness	<ul style="list-style-type: none"> ■ Feasibility of implementation of Off-site emergency planning 	
2. Seismic Data with Possible Scenarios	<p>Overview of seismic studies</p> <p>Seismic evaluation methodologies</p>	<ul style="list-style-type: none"> ■ Principles of Seismic Margin Analysis (SMA) ■ Seismic Probabilistic Safety Analysis (SPSA) 	To explain some systems / structures and component designs. Sensitive seismic issues.
3. Quality Management	<p>Concept of Quality Management</p> <p>Quality Assurance during Design & Construction</p> <p>Quality Assurance during Maintenance & Operations</p> <p>Quality Assurance for record keeping</p> <p>Practical approaches for implementing standards and codes</p>	<ul style="list-style-type: none"> ■ Various Quality Management Systems ■ Vendor Surveillance, Specifications checks, ■ Applicable Codes and Standards ■ Quality Procurement Specifications – Quality Evaluation activity, Quality Audit, Quality Surveillance, Quality Inspection, Quality document review ■ Operation, Maintenance, Testing, In-service Inspection and Technical Operation Control Procedures ■ Preventive and Predictive Maintenance, Temporary and Permanent Modification 	To explain QA requirements for different systems and components for example Nuclear Steam Supply System (NSSS), Turbine, Generator, Pumps etc.
4. Nuclear Safety	<p>Introduction to Nuclear safety</p> <p>Nuclear safety criteria</p> <p>Reactor safety analysis</p> <p>Safety systems</p> <p>Operating Experiences in safety</p> <p>Classification of accidents</p> <p>Dispersion of radioactive releases</p> <p>Classification of components</p> <p>Failure mechanisms</p> <p>Introduction to engineered safety features</p>	<ul style="list-style-type: none"> ■ Objective, Breach of nuclear safety in NPP Accident ■ Containment of radioactive releases ■ Safety Barriers ■ Principle sources, Significant Events at NPPs, ■ The "International Nuclear Event Scale" ■ Design Basis Accidents, Beyond Design Basis Accidents, External Accident due to natural Causes ■ Dispersion Phenomena, Evaluation Techniques ■ Classification on the basis of Safety Functions ■ Classification of pressure components on the basis of mechanical complexity ■ Classification on the basis of resistance to external impacts 	Get familiar with different safety systems: Primary Containment Air Locks, Isolation Valves (PCIVs), Air Temperature Low-Low Set (LLS) Valves, Residual Heat Removal (RHR) Containment Spray System, Penetration Valve Leakage Control System (PVLCS), Main Steam Isolation Valve (MSIV), Leakage Control System (LCS), Suppression Pool, Hydrogen Igniters, Drywell Purge System,

Outline of Training Modules

COURSE NAME	DESCRIPTION OF THE COURSE	SPECIFIC TOPICS	PLANT WALKDOWN
4. Nuclear Safety (Contd.)		<ul style="list-style-type: none"> ■ Classification on the basis of I & C systems based on their safety functions ■ Classification on the basis of Quality Assurance requirements ■ Reactor Pressure Vessel, Piping, Pump, Valves, Containment System ■ General characteristics, IAEA criteria, US general design criteria, EUR criteria ■ Probabilistic Safety Analysis (PSA) and Deterministic Safety Analysis (DSA) 	Secondary Containment Isolation Valves (SCIVs), Standby Gas Treatment (SGT) System, Drywell Air Lock, Drywell Isolation Valves, Drywell Vacuum Relief System, Reactor, Vessel Head, Sealing Feature, Bolting Features, Installation, Support Penetrations
5. Instrumentation & Control Systems	Overview of nuclear instrumentation systems Process instrumentation Reactivity Measurement Control rod drive mechanism Control room panels Operator information systems Reactor protection systems	<ul style="list-style-type: none"> ■ Neutronic Instrumentation ■ Source and Intermediate Range Detector, Radiation Counters, Pressure Transmitter, Temperature Probes, ■ Pressurize Heater Controller, Reactor Trip Breaker, Traversing In-core Probe System, Multi-channel Analyzer, Spectroscope, Sensor, Controllers, Rod Position Indication System, Alarms and Enunciators, Control valves ■ Instrumentation and control associated with ECCS, LDS, HPCF, RCIC ■ I & C associated with Automatic depressurization system and recirculation flow control 	Emergency Core Cooling Systems (ECCS), Leak Detection And Isolation System (LDS), RHR System, Recirculation Flow Control System, High Pressure Core Flooder (HPCF) System, Automatic Depressurization Subsystem (ADS), Reactor Core Isolation Cooling (RCIC) System, Safety Valve Control System, Turbine Bypass Control System.
6. Plant Engineering	Reactor design features Reactor components Fuel design features Operational physics Thermal Hydraulics Reactor safety Safety barriers Reactor controls Containment design & system Core spray system Suppression pools Auto blow down system Accident prevention provisions Fuel handling facilities Accident mitigation	<ul style="list-style-type: none"> ■ BWR, PWR, CANDU, ABWR, AP1000, EPR, AGR, PHWR, APR 1400, VVER, ESBWR and GENERATION IV ■ Core internals, functions of core internals ■ Reactor materials ■ Different types of fuel, fuel design, fuel failures, ■ Coolant flow ■ Fission process, neutron transport concept, ■ Nuclear design, kinematics and control ■ Heat transport system ■ Engineered safety features, Design basis evaluations, ■ Spent fuel handling, ■ Diesel Generators, LPCI, HPCI, ECCS, ■ Containment cooling, power supplies, RHR ■ Function of control rods, Adjuster rods, ■ Liquid poison shut down system ■ Inherent safety features ■ Reactor Protection System, Shutdown Cooling System 	Internals such as grid, control rods, control blades, neutron monitors, core barrel, recirculation pumps, jet pumps, moisture separators, reactor vessel head, sealing feature, bolting features, installation, support penetrations, fuel bundle, channel, flow path, design of fuel, control rod system line up and its functioning in field, containment spray system, line up and operation in field, suppression pool, its link with core spray and containment system, spent fuel pool system design.
7. Plant Operations & Maintenance	Principles of Operations & Maintenance Training NPP personnel Performance criteria Supervision & Responsibility Operations Management Shift Management	<ul style="list-style-type: none"> ■ Organizational Structure, Staffing, Competency ■ Competency and Licensing ■ Performance Monitoring and Control Requirements ■ Procedures ■ Activities in Control Room ■ Technical Workshops and Interfaces 	See Nuclear Safety, Plant Engineering sections and I&C

COURSE NAME			
	DESCRIPTION OF THE COURSE	SPECIFIC TOPICS	PLANT WALKDOWN
7. Plant Operations & Maintenance (Contd.)	Technical specifications	<ul style="list-style-type: none"> ■ Responsibilities, Authorization and Communications ■ Limiting Conditions and Allowable Deviations ■ Trending, Monitoring Evaluations ■ Configuration Management Requirements ■ Testing, Staffing, Inspections ■ Performance Evaluation of various Approaches ■ Information Collection and Benchmarking 	
	Outage management		
Plant life management			
Principles of operations			
Spent fuel management			
8. Nuclear Law	Basic principles of international law	Types of legal instruments <ul style="list-style-type: none"> ■ Binding instruments such as Conventions, Agreements and Treaties ■ Non-binding instruments such as Codes of Conduct and Concept of Soft Law ■ UN Security Council Resolutions, UN Charter, Chapter VII Resolutions 	The physical protection /essential elements of safeguards measures will be shown during the walkdown outside and inside the plant.
	Areas of and Actors in International Nuclear Law	<ul style="list-style-type: none"> ■ Incorporation into national law, Different constitutional approaches ■ Principles of International Nuclear Law ■ Nuclear Safety, Security, Safeguards, Liability ■ 3S concept and synergies between different areas ■ IAEA, OECD/NEA, EURATOM, ABACC 	
	International Nuclear Safety Law	<ul style="list-style-type: none"> ■ Convention on Nuclear Safety ■ Conventions on Early Notification of a Nuclear Accident and on Assistance in the case of a Nuclear Accident including the IAEA emergency response network. ■ Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste management ■ Overview of IAEA Safety Standards and Missions (IRRS, NRSW,) 	
	International Nuclear Security Law	<ul style="list-style-type: none"> ■ Convention on the Physical Protection of Nuclear Material ■ UN Security Council Resolutions 1373 and 1540 ■ INFCIRC/225/Rev.4 ■ Overview of IAEA Security Guidelines and Missions (INSServ, IPPAS) 	
	International Nuclear Non-Proliferation Law	<ul style="list-style-type: none"> ■ Nuclear Non-proliferation Treaty ■ Comprehensive Test Ban Treaty ■ Nuclear Terrorism Convention ■ Regional Nuclear Weapons Free Zones ■ IAEA Safeguards <ul style="list-style-type: none"> — Safeguards system — Item-specific safeguards (INFCIRC/66/Rev.2) — Comprehensive Safeguards (INFCIRC/153 (corrected)) — Additional Protocol (INFCIRC/540 (corrected)) ■ IAEA SSAC Missions Other initiatives (Zangger Committee, Nuclear Suppliers Group)	

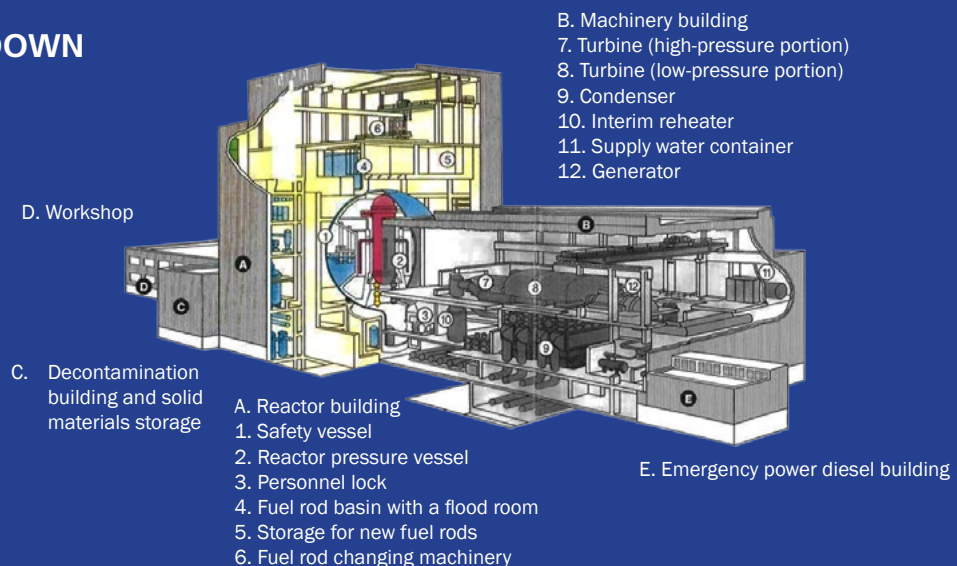
Outline of Training Modules

COURSE NAME			
	DESCRIPTION OF THE COURSE	SPECIFIC TOPICS	PLANT WALKDOWN
9. Licensing Procedures & Methodology	<p>Introduction to regulatory bodies</p> <p>License procedures for lifecycle of NPP</p>	<ul style="list-style-type: none"> Regulatory body, Infrastructure, Staffing and Technical Competence Involvement of Stakeholders, Site Permits, Design certification, Reviews, Safety Evaluation Report, Construction Permits, Commission Permit and Operation Permits. 	To understand general layout and Regulatory Inspection of NPP System, Structures and Components (SSCs)
10. Nuclear Security measures at NPPs	Security measures at different types of nuclear power plants	<ul style="list-style-type: none"> Physical Protection requirements: <ol style="list-style-type: none"> Security plans Security organization Physical protection procedures Vulnerability assessments and scenarios of potential adversary actions Design basis threat (DBT) Physical protection technologies Engineering safety for protection against sabotage 	The physical protection measures and their weakness will be shown during the walkdown outside and inside the plant. "Barriers, access routes, access controls and procedures, access authorization, detection and surveillance, communications and Response procedures, notifications procedures
11. Application of Safeguards in NPP		<ul style="list-style-type: none"> Diversion Scenarios Measurement systems/Nuclear Material Accounting system Design information verification 	Identify and explain the procedures for implementation of safeguards.
12. Radiation Protection & Environmental Monitoring	<p>Radiation protection procedures</p> <p>Monitoring instrumentation</p> <p>Dose budgeting</p> <p>Introduction to off-normal incidents</p> <p>Environmental monitoring techniques</p> <p>Planning for highly radioactive jobs</p>	<ul style="list-style-type: none"> Workplace monitoring, Area radiation monitoring Survey techniques Air monitoring techniques for particulates of different size, Control of exposures, Iodine characterization, Contamination monitoring techniques Area Monitoring Instrumentation, Stack Monitoring Instrumentation ALARA (As Low As Reasonably Achievable) Wide spread contamination, High air activity Sampling plan for onsite and off-site, Sampling and measurements of environmental samples, Laboratory procedures Contamination monitoring techniques 	A visit to CTBTO Monitoring System / SEIBERSDORF Laboratories
13. Radiation Emergency Planning & Response	Requirements for infrastructure for emergency response	<ul style="list-style-type: none"> Area monitoring Instrumentation, Stack monitoring Instrumentation ALARA (As low as reasonably achievable) Techniques Wide spread contamination, High air activity Sampling plan for onsite and off-site, Sampling and measurements of environmental samples, Laboratory Procedures Contamination monitoring techniques 	A visit to the IAEA Emergency Response Unit
14. Safety Culture		<ul style="list-style-type: none"> Code of conduct, Nuclear Industry Operating Organization Culture and Ethics 	

One Day Technical Visit Training

TIME	ACTIVITY
09:00	DEPARTURE FROM VIENNA
09:45	ARRIVAL AT ZWENTENDORF
10:00-11:00	<p>INTRODUCTION LECTURE</p> <p>1. History of Austrian NPP programme: Decision-making, how did it start, why did it stop (public acceptance), who was involved, siting considerations etc.</p> <p>2. Basic overview of NPP technology: Comparisons of technologies, safety measures etc.</p> <p>3. Short film on construction of Zwentendorf NPP</p>
11:00-12:00	<p>PLANT WALKDOWN:</p> <p>Sections, features and functioning of the NPP: Element fuelling system, reactor vessel, structures of the reactor vessel safety systems, emergency condensing system, condensers, turbines, fuel rods, control rods, the emergency shutdown systems, arrangements for power backup system (diesel generators).</p>
12:00-13:00	LUNCH
13:00-15:00	<p>PLANT WALKDOWN CONTINUES:</p> <p>Sections, features and functioning of the NPP: Element fuelling system, reactor vessel, structures of the reactor vessel safety systems, emergency condensing system, condensers, turbines, fuel rods, control rods, the emergency shutdown systems, arrangements for power backup system (diesel generators).</p>
16:00	DEPARTURE FROM ZWENTENDORF
17:00	ARRIVAL IN VIENNA

PLAN FOR WALKDOWN



CVs of Management Team

Professor Dr. Helmuth BOECK

Areas of Specialization

- Reactor Technology
- Reactor Safety
- Reactor Instrumentation
- Reactor Physics

Relevant experience

- Reactor Manager of the 250 kW TRIGA reactor at the Atominstitut der Österreichischen Universitäten.
- Professor at the Atominstitut for "Reactor Safety". holding regular courses and lectures on reactor technology, reactor physics.
- Coordinator and Supervisor for about 70 students during their academic studies leading to Masters Degree or PhD.
- Expert to IAEA within the Technical Assistance Programme.
- Expert to the EU to assist the JRC with the execution of the Action Plan on Historical Liabilities.
- Member of the EU project on Coordination of Nuclear Engineering Education in Europe and of the follow up project NEPTUNO.
- Project member for construction and operations of Zwentendorf Nuclear Power Plant (1972-1980).
- Providing inputs and assessments to Austrian Authorities on Fukushima accident.
- Several publications in nuclear Physics and Engineering.

Professional Memberships

President of the Austrian Nuclear Society, member of German Nuclear Society, American Nuclear Society, Austrian Society for Radiation Protection, Commission on Decommissioning of Research Reactors, International Scientific Council on the Safety of the Temelin NPP.

Education

PhD in Technical Physics at the Technical University, Vienna.

Thesis work at the Technical University Vienna on: "Investigation of fuel elements of research reactors for the release of gaseous fission products".

Engineer Otmar PROMBER

Areas of Specialization

- Reactor Technology
- Reactor Safety
- Reactor Operation
- Regulatory Systems
- Reactor Instrumentation & Control
- Mechanical Engineering

Professional Highlights and Experience

- Since 04/2016 Areva GmbH, Olkiluoto, Finland Expert, Field Engineering Manager. Expertise and engineering support for commissioning, participation at commissioning tests and assessment of test results, engineering representative in technical change and expert committees, discussions of design changes/solution with the customer and authorities.
- Has extensive knowledge of the Technical Design of ZWENTENDOF NPP and is a trainer for Areva at several technology trainings at Zwentendorf for personnel from different NPPs.
- 2013-2016 Areva GmbH, Oskarshamn, Sweden Head of the Site Engineering
 - Leading the site engineering team and the Site Design Office for the PLEX Project (Large Safety Upgrade and Modernization of a BWR including e.g. new safety I&C, new main control room, installation of new and upgrade of existing process systems, installation of four new emergency diesel in two new buildings).
 - Support both the installation and commissioning team with preparation and implementation of design changes as well as trouble shooting.
 - Support the project and site management with technical expertise.
 - Presentation and discussions of technical solution or changes with the customer and authorities.
- 2011-2013 Areva GmbH, Germany Chief Engineer, BWR Modernization Project
 - Expert with focus on systems/plant performance and verification.
 - Successfully solving of interdisciplinary design issues.
 - Preparation and review of design documentation.
 - Participation as technical expert in meetings with customer and authorities.
 - Deputy Sub-Project Manager Process and Safety.
- 2008-2011 Systems Engineering BWR, Team Leader NSSS
 - Development and Design of New BWR Reactors.
 - Design and Specification of NSSS and turbine systems.
 - Supporting and evaluation of transient and safety analysis.
 - BWR technology training courses for internal and external customers.
- 2003-2007 Vienna University of Technology, Austria Assistant Professor; Energy Systems and Thermodynamics
 - Research and development of CFD methods to analysis of hydraulic machines (pumps/turbines).
 - Laboratory testing and measurements (model tests, PIV methods) on hydraulic turbo machines for verification and validation of calculation results.
- 1994– 2003 HIGHTEX Special Purpose Machinery GmbH, Austria Mechanical as well as Electrical and I&C Design

Professional Memberships

WANO Peer Review at Forsmark NPP, Sweden

Member of the American Society of Mechanical Engineers

Member of the Board of the Austrian Nuclear Society (ÖKTG)

Member of the German Nuclear Society (KTG)

Education

MSc Nuclear Engineering, Technische Universität München; MSc Mechanical Engineering (Energy and Nuclear Engineering), Vienna University of Technology Mechanical Engineering.

CVs of Management Team

Dr. Kaluba CHITUMBO	Areas of Specialization <ul style="list-style-type: none">■ Nuclear Technology■ Nuclear Chemistry■ Energy Control and Regulatory Systems■ Nuclear Safeguards■ Non-proliferation■ Nuclear Disarmament
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Professional Highlights and Experience

- Present: Faculty Member, Vienna University of Technology. Lectures on Nuclear Energy, Safety and Security, Conventions and agreements. Supervises students towards MSc Degree in the areas of nuclear energy and Environmental engineering.
- Present: Technical management, Zwenterndorf Training Center, conducted a number of training courses to engineering student and for IAEA students/ staff from Member States.
- Present: Senior Partner, Rientec GmbH; Consultant to countries embarking on introducing different energy options in the mix (Strategic Plans, Feasibility studies, Bid Invitation Specifications, Sitting, Electrical Grid Analysis; Environmental Impact Analysis , Training).
- Present: On IAEA "Expert Roster" and undertaken expert missions to a number of countries to assist and give advice on launching Nuclear Power Programme including road map to meet the IAEA Milestones.
- 1983-2008 Former Director – Department of Safeguards at International Atomic Energy Agency (IAEA), Vienna, Austria (Director of Information Technology and Director of Operation Division covering different countries e.g. Japan, South & North Korea, China etc.).
- 2009 invited to give seminars in South Korea at Korea Atomic Energy Research Institute (KAERI) and Korea Institute of Nuclear Non-proliferation and Control (KINAC).
- More than 30 years of working experience in Nuclear Technology and Safeguards (Enrichment, Fabrication Plants, Nuclear Power Plants, Reprocessing Plants, Research Reactors and Critical Assemblies and R&D activities), Non-Proliferation, Disarmament.
- Several publications in the areas of nuclear sciences, safeguards and non-proliferation including book chapter on use of high resolution Satellite imagery.

International Experience

- Responsible for implementation of IAEA Safeguards in Asia (Japan, South Korea, North Korea (DPRK), Indonesia, Australia, Malaysia, Myanmar, People's Republic of China, Taiwan, China, Vietnam, Small Quantity Protocol countries).
- Led teams in sensitive negotiations with IAEA member states in implementing their Nuclear Non-Proliferation obligations and assisting Member States in establishing Nuclear Material Control and Regulatory Systems.
- Member of the IAEA Nuclear Power Support Group engaged in advising and assisting Member States in dealing with considerations to launch a peaceful nuclear programme.
- Secretary to the Committee II at the NPT Review Conference, United Nations, New York in 1995.
- Member of the First Panel Established by the President of the Security Council on 30 January 1999 (S/1999/100), Concerning Disarmament and Current AND future Ongoing Monitoring and Verification Issues.

Education

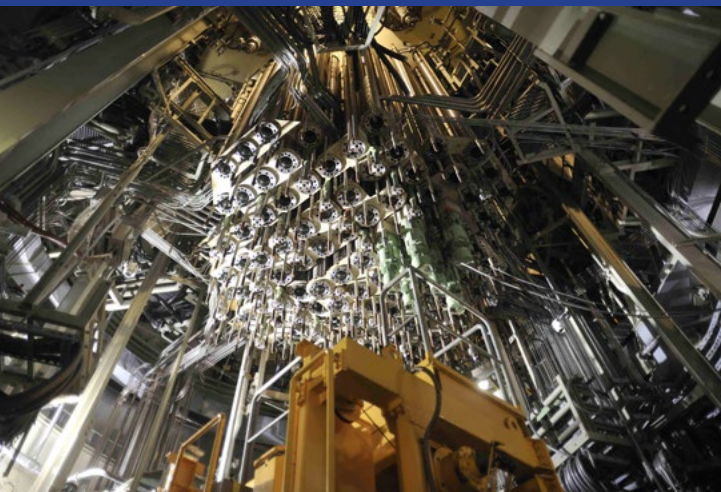
Post-graduate Research, Queens University, Kingston, Ontario, Canada
Ph.D. in Physical Chemistry University of Uppsala, Sweden



About Zwentendorf NPP Training Centre

The Zwentendorf Nuclear Power Plant in Austria is a 723 MWe Boiling Water Reactor (BWR) plant situated in the picturesque countryside of Tullnerfeld, just a one-hour long drive from the International Atomic Energy Agency (IAEA) in Vienna. The plant was built in 1978, was ready to operate, but was never commissioned due to a policy decision of the Austrian Government.

RIENTEC, along with the plant owners EVN Liegenschaftsverwaltung GmbH, has established this plant as a training centre that offers unrestricted and radiation free



accessibility, which is not available in an operating NPP. The centre provides a realistic environment for hands-on training in the areas of management, operation, maintenance and technical support of a nuclear power plant to develop a highly skilled workforce for the global nuclear industry.

About RIENTEC

RIENTEC GmbH is a Vienna, Austria headquartered company, with competencies underpinned in nuclear energy related services and technologies. RIENTEC is resourced by some of the finest members in the nuclear industry consisting of academia and practitioners, and staff from international agencies. We bring subject matter experts for each of the services.

Contact:

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Weekend plans and suggested activities

Austria Activities

Vienna – Mayerling Tour (Half Day)



A half-day excursion which shows you the most beautiful sights of the southern part of the Vienna Woods. Passing the Roman City of Baden which is famous for its thermal springs, we drive through the romantic valley Helenental to the former Mayerling hunting lodge, (visit of memorial chapel), where Crown Prince Rudolph together with Baroness Vetsera died tragically in 1889. In the Cistercian Abbey of Heiligenkreuz (1133) you visit the medieval cloister which houses the remains of the last Babenberger. We then pass

the Höldrichsmühle and arrive at the Seegrotte. After a boat ride on the largest subterranean lake in Europe you leave the Vienna Woods and return to Vienna.

City & Schönbrunn Palace Tour (3 Hours)



With Vienna Sightseeing no waiting time at Schönbrunn Palace! This tour will give you an overall impression of the most significant historical sights of Vienna. Along the Ringstrasse we show you numerous grand buildings, such as the Museum of Applied Arts (MAK), the State Opera House, the magnificent Museum of Fine Arts with its world famous art treasures of the Habsburgs and the Natural History Museum, the cultural district the Museums Quartier, the Hofburg (the former Habsburg winter residence), the Parliament, the City Hall and the Burgtheater.

We drive past the Belvedere Palace which houses the largest and most precious Gustav Klimt collection in the world. The highlight of this tour will be a visit of the showrooms of Schönbrunn Palace, once the summer residence of the Habsburg family and home of Maria Theresia. In case the City Tour ends at Südtiroler Platz – free transfer to State Opera!

Danube Valley (7 Hours)



Through this romantic scenery full of history and legends the Danube winds its way past charming old villages and steep vineyards. The old castles tell us about the former importance of this trade- and traffic way, one of them - Dürnstein - especially famous, because here King Richard Lionheart was imprisoned, while waiting for his ransom to arrive from England, raised by his faithful Minstrel Blondel. During a romantic boat-trip the history comes alive. The heart of the Wachau is the old wine-merchants' town Krems. The highlight of this excursion will be the visit of the Benedictine abbey of Melk, one of Austria's most

famous Baroque buildings, which together with the Wachau area, won the award for "Best Historic Destination of the World" in 2008.

Salzburg (Full Day)



On our way to Mozart's town of birth you become acquainted with the beautiful Salzkammergut landscape with its mountains and its numerous lakes, where the Emperor Franz Joseph and his family used to spend their holidays. Skirting the Lake Fuschl and Lake Wolfgang you reach Salzburg, where you will have time for lunch. The afternoon will be dedicated to a stroll through the old city, showing you the most important sights of this old Bishop's Seat. These are the Cathedral, the Festival Hall, St. Peter's Abbey Church and its graveyard (tomb of Mozart's sister Nannerl). Of course we will show you Mozart's birth place in the Getreidegasse. The Edelweiss-Song from the movie Sound of Music will come to your memory, while passing the horse-pond and from the gardens of Mirabell-Palace you will have a marvelous view of the Hohensalzburg Fortress.

Neighboring Countries Activities

Bratislava by Bus – Boat (7 Hours)



The excursion to Bratislava, the capital of Slovakia, by modern public transit bus begins at 08:30. The city walk - your guide will be waiting for you upon arrival in Bratislava - takes you to the picturesque old town. After lunch (included) there still remains enough time for you to stroll around and to shop. At 14.30h you return by speedboat: TWIN CITY LINER. Experience travelling at high speed and at the same time in supreme comfort. The catamaran is fully air-conditioned. After passing through the untouched and protected Danube River wetlands and National Park Donau-Auen the tour ends at Vienna at 16.00h.

Prague (Full Day)

After a drive through the characteristic landscape of Moravia you reach Prague, the golden city on the banks of the Moldavia, the economic and cultural centre of Bohemia. Possibility for lunch. Afterwards drive to Hradshin (Royal Palace). In the afternoon we take you on an extensive city tour, showing you the wonderful panorama of the city from Charles bridge, the National Theatre, the elegant residences on the Moldavien river banks, the Jewish cemetery (individual visit possible), the Parisian street, the old town square and Wencels square. There will be certainly enough time for shopping or exploring the old quarters of Prague.

Budapest (Full Day)

A drive through the enchanting countryside of western Hungary will take you to Budapest, a city rich in traditions, situated on the banks of the Danube (time for lunch). In the afternoon during an extensive city tour through the districts of Budapest, you will be able to appreciate the historical and cultural importance of this city (city walk). At 05:00 p.m. we start the return journey to Vienna.