

# Lecture at Warsaw University of Technology WUT

## **EPR Steam Generator** 22th to 26th of mai 2023

Faculty of Power and Aeronautical Engineering, Nuclear Engineering

**Welcome** by **Thierry Deschaux** - Director EDF Poland – Monday 14h

**Conception of Steam Generators 1<sup>st</sup> part** – Monday 14h30 – 17h

Romuald Jurkowski

**2<sup>nd</sup> part** – Tuesday 9h – 12h

1. **SG main features**
2. **SG identification**
3. **SG functions and design criteria**
4. **Axial economizer SG principle and advantage**
5. **Conception and design**

**SG Operation** - Tuesday 14h – 17h

Romuald Jurkowski,

- 1 **Internal Flows**
- 2 **Heat Transfer**
- 3 **Steady State Operation**
4. **Transient Operation**
5. **Water Level Measurement and Control**
6. **Operating Limits**

**SG Calculation** – Wednesday 9h – 12h

Romuald Jurkowski,

1. **Mechanical Calculation**
2. **CHemical Calculation**
3. **Thermohydraulique Calculation**
4. **Heat Transfer**
5. **Dryout**
6. **Testing Facilities**
- 7 **Tube Degradation**
8. **Vibration phenomena**

### **Code THYC Steam Generator 3D – Wednesday 14h – 17h**

Franck David , EDF Research Center , Paris

- EDF R&D : short overview
- Two phase flow formulation in the EDF TH code for SG
- Validation program,
- Introduction to fouling and TSP clogging in SG

### **Manufacturing of Steam Generators– Thursday 9h – 12h**

Nadege Renou, Framatome

- Manufacturing
- Assembly,
- Maintenance,

### **Mechanical approach calculations – Thursday 14h – 17h**

Fabien Ducrozet, Framatome, Center CCBu

- Presentation of the objectives of a stress report
- Calculation for fatigue & progressive strain analyses in the components
- Calculation for fast fracture analysis

### **Thermal-hydraulics of the MSGTR on the basis of experimental investigation – Friday 9 – 12h**

Rafal Bryk, Framatome GmbH,

- PKL test Facility
- Multiple Steam Generator Tube Rupture,
- MSGTR – experimental investigation

Discussion, questions,

Conclusions ,

Homework