



A.N.T. International Academy

ONLINE EDUCATION

Thermal/Hydraulics in PWR Fuel

COURSE DESCRIPTION

Engineers are taught in school the basic fundamentals of the physical process involved in nuclear power generation. Once employed in the industry, the specific design and requirements of the finished fuel product are observed through day to day activities. Often what is missing is a clear path linking the relationship of the physics to the finished product.

The design of this course is to cover the basic physical laws related to nuclear fuel and show how these directly affect the design, analysis, and operation of both the fuel and related reactor systems. The discussion will show the links from the fundamental equations to the fuel design, through the cycle analyses, and culminating with the operating limits in PWRs. The course will focus mainly on the thermal-hydraulic and neutronics of the fuel but will also include key fuel rod mechanical items. In addition, a short discussion will show real life examples of how application of basic fundamentals can explain observed operating anomalies.



The content is described more in the [Appendix](#).

COURSE MATERIAL

The course material was developed by A.N.T. International and consists of modified/edited earlier recorded A.N.T. International Seminar.

AUTHORS/LECTURERS

The authors/lecturers of the reports and lectures, World Class Experts in their fields, are as follows:

Kenneth Epperson.

[Read more about the Experts](#)

COURSE DURATION

- Total time: 4 hours
- Lectures: 4 h

The listed time for the lectures is the actual running time. More time may be needed to digest the information provided in this course.

CERTIFICATE

You will automatically receive an email with your certificate that you can print or share on social media. If you need a printed certificate, please don't hesitate to contact us and we can send it to you via regular mail. You reach us at support@antinternational.com.

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Appendix: Course outline and topics covered

1) NEUTRONICS

- » Basic Relationships, including key assumptions for PWR application
- » Relationship of key Components to Reaction Rate Equation
- » Safety Criteria for PWR Operation
- » Key parameters for Cycle Design and Analyses

2) THERMAL HYDRAULICS

- » Basic Equations for PWR application
- » Forms of Heat Transfer in PWRs
- » Safety Criteria for Cycle Operation
- » DNB Protection in Fuel Cycle Designs

3) FUEL ROD MECHANICAL DESIGN

- » Basic Equations and Relationships
- » Safety Criteria for Cycle Operation

4) APPLICATION OF FUNDAMENTALS TO OPERATING ANOMALIES

- » Reactor Instrumentation Characteristics
- » Crud Induced Power Shift (CIPS)
- » Reactor Coolant System flow changes



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