



A.N.T. International Academy

ONLINE EDUCATION

Fuel Reliability

COURSE DESCRIPTION

The purpose of this course is to provide insight how increased fuel reliability can be obtained by:

- Reducing the primary fuel failure frequency and minimise the consequences of fuel failures when they occur and
- Minimising operational effects due to factors such as fuel assembly and channel bowing, that can affect thermal margins (LOCA, DNB, Dryout) and core control capabilities (control rod insertion).



In this course, reliability is considered in terms of:

- The ability of the cladding and end plugs comprising a fuel rod to isolate the fuel material and fission products from the primary coolant and to maintain the fissile material in the intended configuration. Failure is defined as the loss of the barrier between the rod interior and coolant such that fission products, fuel material or both are released to the primary coolant.
- Assuring that the fuel system dimensions remain within operational tolerances, and that functional capabilities are not reduced below those assumed in the safety analysis.

Poor fuel reliability can have adverse effects on:

- Reduced thermal and safety margins,
- Power generation,
- Outage time,
- Chemistry and radiation monitoring costs,
- Personnel exposure,
- Handling, transportation, storage and reprocessing.

The lectures can be accessed at times convenient for practicing engineers and managers. Assessment are done online, with an understanding of the current material (i.e., 70% required correct answers). After passing the test, a certificate will be issued to the student.

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:

Charles Patterson, and Peter Rudling.

[*Read more about the Experts*](#)

COURSE DURATION

- Total time: About 15 hours of materials, estimated time to finish, up to 1 week (full time studies)
- 1 Test: 1 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.

CONTACT

For more information and/or an offer welcome to contact us at sales@antinternational.com

Please also visit our website for the latest updated information, www.antinternational.com



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Appendix: Course outline and topics covered

FUEL RELIABILITY

- » Introduction
- » Complementary Reading - Fuel Reliability
- » Primary Failure Causes (Corrosion & HPU)
- » Monitoring Fuel Reliability
- » Secondary Degradation
- » Poolside Techniques (Fuel Sipping)
- » Poolside Techniques (Hot Cell Examinations & Means to Improve Fuel Reliability)
- » Summary and Discussions



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