

# Joint ICTP-IAEA 3rd Course on Scientific Novelties in the Phenomenology of Severe Accidents in Water Cooled Reactors



**5 - 9 October 2020**  
**Trieste, Italy**

Further information:  
<http://indico.ictp.it/event/9126/>  
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The course programme covers scientific topics of direct relevance to the physical, chemical and radiological phenomena occurring during progression of severe accidents in Water Cooled Reactors, including an overview of past events and advanced technologies designed to cope with such events.

## Description:

The course aims at building a comprehensive understanding of the complex phenomena associated with progression of severe accidents in WCRs and their consequences. Knowledge transfer will be facilitated between the international expert lecturers and the young nuclear professional and engineer participants through discussions and hands-on learning, with the goal to gain a comprehensive understanding of the physical, chemical and radiological phenomena specific to severe accidents in WCRs. Relevant nuclear safety principles, recent advancements in scientific methods, approaches and simulation tools to assess the interrelated phenomena during different phases of severe accident progression, and the role of technologies designed to prevent progression of, and mitigate consequences from, such accidents in WCRs will be presented.

## Prerequisites:

As part of the application, participants should submit a 2-page original essay, covering two of the course topics of their choice from the topic Phenomenology in Severe Accident Progression.

### Introduction

- Physics of Water Cooled Power Reactors
- Nuclear Safety and IAEA Safety Standards for Water Cooled Power Reactors
- Defence in Depth and Plant Design Envelope in Water Cooled Power Reactors
- Progression of Fukushima Daiichi Accident and its Consequences.

### Phenomenology in Severe Accident Progression

- Nuclear Fuel Degradation
- Relocation of Melted Fuel
- In-Vessel Melt Retention
- Reactor Vessel Failure Mechanisms
- Ex-Vessel Corium Cooling
- Early-Phase Containment Failure
- Late-Phase Containment Failure
- Physics and Chemistry of Source Term
- Fission Products Behaviour and Transport
- Hydrogen Generation, Transport and Explosion
- Numerical Simulations of Severe Accident Phenomena

### Phenomenology of Technological Challenges in Propagation of Severe Accidents and Mitigation of their Consequences

- Active and Passive Core and Containment Cooling
- Containment Pressure Venting
- Prevention of Hydrogen Explosions
- Severe Accident Management
- Emergency Preparedness and Response
- Waste Management and Decommissioning after Severe Accidents

## Directors:

**A. MIASSOEDOV, IAEA**  
**S. MASSARA, IAEA**

## Local Organizer:

**N. BINGGELI, ICTP**

## How to apply:

Online application:  
<http://indico.ictp.it/event/9126/>

Female scientists are encouraged to apply.

## Grants:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

## Deadline:

**30 June 2020**



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