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KTH VETENSKAP OCH KONST

SARnet

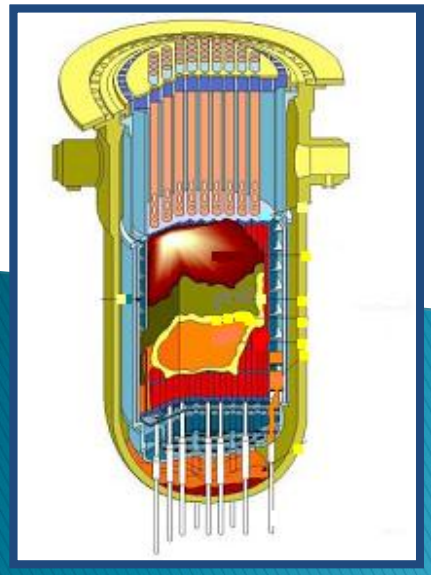
Short Course on

Severe Accident Phenomenology - 2015

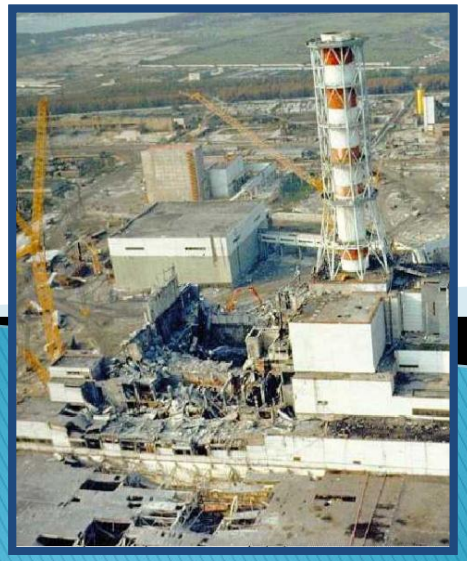
Stockholm (S)

July 6th-10th , 2015

jointly organized by KTH, CEA, IRSN and University of Pisa



TMI-2 Reactor Vessel-Core damage



Tchernobyl Reactor Building damage

Fukushima Daiichi

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A new one-week Course entitled "Severe Accident Phenomenology" is proposed in the frame of SARNET Severe Accident (SA) research network of excellence.

This course will focus on disseminating the knowledge gained on SA in the last two decades to Masters-PhD students, young engineers and researchers. It will be organized by KTH, CEA, IRSN and University of Pisa and will be hosted by KTH at Stockholm. This short course is a sequel to the previous London 2013 and Pisa 2011 SARNET Courses. The program will cover SA phenomenology, progression and mitigation in current water-cooled Gen.II and III Nuclear Power Plants (NPP), but also the different design solutions in Gen.III NPPs. A special focus will be on the events at Fukushima-Daiichi.

Lectures will be given by international experts from major Nuclear Institutes, Industries and Universities working on the topic. Lecturers will be able to describe how the different plants would react during a SA, keeping in mind that time constraints of the course would not allow students to actually perform simulations.

The Course will also include background lectures on NPP safety, SA scenarios and the events leading, respectively, to the early and late failure of containment.

It will be open to University students with a discount fee. The course can contribute for 3 ECTS (with a written work) as an advanced course for Master students (through the European Nuclear Education Network ENEN).

cea

KTH VETENSKAP OCH KONST

NPS Kärnkraftsäkerhet

IRSN INSTITUT DE RADIOPROTECTION ET DE SÛRETÉ NUCLÉAIRE

IN SUPREMÆ DIGNITATIS 1343

Organizing Committee
Sevostian Bechta (NPS)
Christophe Journeau (CEA)
Sandro Paci (UNIPI)
Pascal Piluso (CEA)
Jean-Pierre Van Dorsselaere (IRSN)

Steering Committee
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Ivo Kljenak (JSI)
Alexei Miassoedov (KIT)
Sandro Paci (UNIPI)
Pascal Piluso (CEA)

Local Organizers
Sean Roshan Ghias (NPS)
Sofia Nyström (NPS)

More information on :
www.kth.se/sci/sarnet2015

Useful Information

Registration Fees:

- **Professional :** **€ 1,300**
- **Students:** **€ 500**

The fee covers attendance of course lectures, a copy of the course material, coffee breaks and lunches. Travel and accommodation expenses are not included.

Accommodation:

A list of hotels will be available on the course website (under preparation). Participants are expected to make directly their own hotel reservations.

Contacts:

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Draft Schedule-SAP-2015

Monday	Tuesday	Wednesday	Thursday	Friday
8:30-9:00	8h30-10:45	8:30-10:00	8:30-10:00	8:30-10:30
Registration – Coffee	**5- Early In Vessel**	**9-Steam explosion**	**12-Safety assessment (2 h)**	**14-SA Code**
9:00-9:15	• Fuel degradation and reflooding		• PSA Level 1,2	• ASTEC
1-Opening (15 min)	• H2 production			
	• FP release from core			
	• In vessel progression	10:00-11:30		10:30-11:30
9:15-10:45	• Reactors/scenarios	**10-Ex Vessel-Part A**		• MELCOR
2- Historical overview: Accidents in Nuclear Installations		• Spreading		
Classification of accidents		• MCCI and basemat behaviour		
TMI-2, Chernobyl., Fukushima				
10:45-11:00 Coffee Break	10:45-11:00 Coffee Break	11:00-11:30 Coffee Break	10:45-11:00 Coffee Break	11:30-12:00 Coffee Break
11:00-12:30	11:00-12:30	11:30-13:00	11:00-12:30	12:00-13:00
3-Recent Status of Knowledge about the Fukushima Daiichi Accidents	**6-Late In Vessel**	**10-Ex Vessel-Part B**	**13-European Stress tests-**	**15-Gen.III/In Vessel Retention**
	• Focusing effect	• Ex vessel FP and gas release		• AP-1000, ACR 1400,…
	• External cooling	• Coolability		
	• Gap cooling	• Mitigation		
	• Vessel failure			
12:30-14:00 Lunch	12:30-14:00 Lunch	13:00-14:30 Lunch	12:30-14:00 Lunch	13:00-14:00 Lunch
14:00 -15:30	14:00 -15:30	14:30-16:00	14:00-18:00	14:00-15:30
3- SA Crisis management	**7-Early containment failure**	**11-Source Term -Part A**		**16-Gen. III Ex Vessel Retention**
Fukushima crisis	DCH	• Transport in primary system / containment, containment bypass	***Technical tour***	• EPR, APWR. ESBWR..
15:30-16:00 Break	15:30-16:00 Break	16:00-16:30 Break		15:00-15:30 Break
16:00-17:30	16:00-17:30	16:30-18:00		**Feedback-Conclusion**
4- SA environmental impact	**8- Hydrogen**	**11-Source Term-Part B**		
Fukushima impact	• H2 risk	• Chemistry effects (Iodine, Ru)		
Decontamination technics	• H2 distribution in containment	• FP mitigation (filters…)		
Corium treatment	• H2 mitigation			
		19:30 Official Dinner		