



# Fusion Safety and Regulation Course

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## Course Goal

Through a blend of lectures, real-world case studies, and interactive discussions with other fusion professionals, participants will gain the practical knowledge needed to meaningfully engage with the topics of fusion radiation safety and regulation. The course will include key radiation safety considerations for fusion devices, the regulations that apply to planned fusion facilities, and how other industries develop safety cultures.

## Course Organizers and Hosts

The course is organized by Clean Air Task Force (CATF) in partnership with the University of Tennessee, Knoxville (UTK). The course is hosted by Professor Livia Casali at the University of Tennessee with support from Oak Ridge National Lab (ORNL) for site visits.

## Course Location

Zeanah Engineering Complex Room 123, University of Tennessee Knoxville, 863 Neyland Dr, Knoxville, TN 37916

## Course Dates and Times

### **Wednesday, Day 1 | Introduction to Fusion Energy and Fusion Safety | July 29, 2026**

Course Activities: 9 am – 5:15 pm

Reception: 5:15 pm – 7:30 pm

### **Thursday, Day 2 | Case Studies on Radioactive Material, Accelerator, and Fusion Machine Safety | July 30, 2026**

Course Activities: 9 am – 5:30 pm

### **Friday, Day 3 | Considerations for Creating and Implementing Fusion Regulation | July 31, 2026**

Course Activities: 9 am – 5:30 pm

### **(Optional) Monday, Day 4 | Site Visits | August 3, 2026**

ORNL Site Visits: 9 am – 6 pm

## Course Timetable (Draft April 14, 2026)

*Subject to change*

### Wednesday, Day 1 | Introduction to Fusion Energy and Fusion Safety | July 29, 2026

Time	Lecture	Speaker, Affiliation
8:15 – 9:00am	<i>Refreshments available; registration</i>	
9:00 – 9:30am	Introduction to Fusion Energy Technology Safety and Regulation Course	
9:30 am – 10:00am	Keynote	
10:00 – 10:45am	Introduction to fusion energy technology and commercial fusion power plants	
10:45 – 11:15am	<i>Break</i>	
11:15 – 11:25am	<i>Course Photograph</i>	
11:25am – 12:40pm	Overview of different fusion energy concepts and technologies currently under development	
12:40 – 1:30pm	<i>Lunch break</i>	
1:30 – 2:15pm	Radiation safety and shielding principles for fusion	
2:15 pm – 3:15pm	Overview of radiation related fusion energy safety considerations for research and power plants	
3:15 – 3:45 pm	<i>Break</i>	
3:45 -4:15 pm	Overview of industrial and chemical fusion energy safety considerations for research and power plants	
4:15 – 4:45 pm	Importance of appropriate certainty and regulatory efficiency for commercial fusion energy deployment at scale	
4:45 – 5:15 pm	Closing discussion on fusion safety considerations	
5:15 – 6:15 pm	<i>Welcome reception</i>	

**Thursday, Day 2 | Case Studies on Radioactive Material, Accelerator, and Fusion Machine Safety | July 30, 2026**

Time	Lecture	Speaker, Affiliation
8:15 – 9:00am	<i>Refreshments available</i>	
9:00 – 10:00am	Industry experience and best practices for tritium handling and processing	
10:00 – 10:30am	Laboratory experience and best practices for tritium handling and processing	
10:30 – 11:00am	<i>Break</i>	
11:00 – 11:45am	UK national lab experience with tritium safety and management	
11:45am – 12:30pm	US national lab experience with tritium safety and management	
12:30 – 1:15pm	<i>Lunch break</i>	
1:15 – 2:00pm	Panel: Design and operating experience with proposed fusion blanket materials (FLiBe, Lithium, Others)	
2:00 – 2:30pm	CERN experience with activated material safety and activated waste management	
2:30 – 3:00pm	Eurofusion experience with activated material safety and activated waste management	
3:00 – 3:30pm	<i>Break</i>	
3:30 – 4:15pm	Panel: Experience with tritium operations, management, and environmental monitoring	
4:15 – 4:45pm	Case study: Lessons learned with ITER safety case and licensing	
4:45 – 5:15pm	Case study: Lessons learned with JET safety case and licensing	
5:15 – 5:30pm	Closing discussion on fusion case studies	

**Friday, Day 3 | Considerations for Creating and Implementing Fusion Regulation | July 31, 2026**

Time	Lecture	Speaker, Affiliation
8:15 – 9:00am	<i>Refreshments available</i>	
9:00 – 9:30am	Connecting fusion energy safety and fusion energy regulation	
9:30 – 10:00am	Overview of fusion energy safety and regulatory considerations for private fusion energy designs	
10:00 – 10:30am	<i>Break</i>	
10:30 – 11:30am	Panel: United Kingdom - Experience with Commercial Fusion Regulation Development	
11:30 am – 12:15pm	Panel: International – Experience with Commercial Fusion Regulation Development	
12:15 – 1:15pm	<i>Lunch break</i>	
1:15 – 2:15pm	Panel: United States – Experience with Commercial Fusion Regulation Development	
2:15 – 3:00pm	Panel: Agreement State – Experience with Developing Fusion Regulation, Pre-application Engagement, and Initial Licensing	
3:00 – 3:30pm	<i>Break</i>	
3:30 – 4:15pm	Panel: Fusion Byproduct and Waste Management	
4:15 – 5:00pm	Panel: Best Practices on Fusion Energy Public Engagement	
5:00 – 5:30pm	Wrap-up discussions with participants and speakers	



## Monday, Day 4 | Oak Ridge National Lab Site Visits | August 3, 2026

Possible Tour Stops (Subject to Availability and Interest):

- Frontier Supercomputer
- High Flux Isotope Reactor (HFIR)
- Manufacturing Demonstration Facility (MDF)
- Spallation Neutron Source (SNS)
- Materials Plasma Exposure Experiment ([MPEX](#))
- [Pellet Lab](#) (can only fit ~10/15 at a time)
- DRGA Test Stand/Spectroscopy Lab
- Low Activation Materials Development and Analysis ([LAMDA](#))
- Corrosion lab / FliBe loop / liquid metal testing

## Speaker Biographies