



Fusion Safety and Regulation Course

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

Room 405, John D. Tickle Building, 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	Sehila Gonzalez de Vicente, CATF Livia Casali, UTK Troy Carter, ORNL
9:30 am – 10:00am	Keynote	TBC
10:00 – 10:45am	Introduction to fusion energy technology and commercial fusion power plants	Proposed: JP Allain, Penn State
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	Arnie Lumsdaine, ORNL
12:40 – 1:30pm	<i>Lunch break</i>	-
1:30 – 2:15pm	Radiation safety and shielding principles for fusion	Livia Casali, UTK
2:15 pm – 3:15pm	Overview of radiation related fusion energy safety considerations for research and power plants	Invited: Adriaan Riet, INL
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	Invited: Paul Humrickhouse, Type One Energy
4:15 – 4:45 pm	Importance of appropriate certainty and regulatory efficiency for commercial fusion energy deployment at scale	Invited: Sid Fowler, Pillsbury
4:45 – 5:15 pm	Closing discussion on fusion safety considerations	Moderated by CATF
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	Walter Shmayda, Tritium Solutions
10:00 – 10:45am	UK national lab experience with tritium safety and management	Proposed: Alternative Speaker, UKAEA
10:45 – 11:15am	<i>Break</i>	-
11:15am – 12:00pm	US national lab experience with tritium safety and management	Dave Babineau, Director, Tritium Technology Division, SRNL
12:00 – 12:45pm	<i>Lunch break</i>	-
12:45 – 1:30pm	Panel: Design and operating experience with proposed fusion blanket materials (FLiBe, Lithium, Others)	Gus Merwin, Kairos Power Rémi Delaporte-Mathurin, MIT PSFC Invited: Bibake Uppal, Kyoto Fusioneering
1:30 – 2:00pm	CERN experience with activated material safety and activated waste management	Luca Bruno, CERN
2:00 – 2:30pm	Eurofusion experience with activated material safety and activated waste management	Sandrine Rosanvallon, CEA Eurofusion
2:30 – 3:00pm	<i>Break</i>	-
3:00 – 3:45pm	Panel: Experience with tritium operations, management, and environmental monitoring	Diana Grandas, EPRI Dave Babneau (Director, Tritium Technology Division, SRNL) Invited: TVA Watts Bar
3:45 – 4:15pm	Case study: Lessons learned with JT-60SA safety case and licensing	Invited: Koji Takahashi, QST
4:15 – 4:45pm	Case study: Lessons learned with JET safety case and licensing	Invited: UKAEA
4:45 – 5:15pm	Case study: Lessons learned with ITER safety case and licensing	Invited: Jöelle Elbez-Uzan, CEA Eurofusion
5:15 – 5:30pm	Closing discussion on fusion case studies	Moderated by CATF

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	Patrick White, CATF
9:30 – 10:00am	Case Study on Safety-By-Design for Fusion Energy	Larry Harisis, Type One Energy
10:00 – 10:30am	<i>Break</i>	-
10:30 – 11:30am	Panel: International Experience with Commercial Fusion Regulation Development	Stuart Muldrew, Industry/STEP Invited: Francisco Gastejón, CNS Spain
11:30am – 12:00pm	International Regulatory Considerations for Fusion Safeguards and Byproduct Material Management	Invited: Prof Howard Hall, UTK Invited: Jackson Stanley, UTK
12:00 – 1:00pm	<i>Lunch break</i>	-
1:00 – 2:00pm	Panel: United States – Experience with Commercial Fusion Regulation Development	Ed Harvey, NRC Andrew Proffitt, Helion Pascal Dumont, Type One Energy Becki Harisis, OAS (TN)
2:00 – 2:45pm	Panel: Agreement State – Experience with Developing Fusion Regulation, Pre-application Engagement, and Initial Licensing	Beth Shelton, Tennessee Invited: WA Fusion Regulator, Washington Lea Perlas, Virginia
2:45 – 3:15pm	<i>Break</i>	-
3:15 – 4:15pm	Panel: Fusion Byproduct and Waste Management	Sandrine Rosanvallon, CEA Eurofusion Ed Harvey, NRC Tom Hansen, Southeast Compact Commission Invited: Energy Solutions
4:15 – 5:00pm	Panel: Experience with Fusion Energy Public Engagement	Andrea Schneibel, Type One Energy Lea Perlas, Virginia Jeff Semancik, CT DEEP
5:00 – 5:30pm	Wrap-up discussions with participants and speakers	Moderated by CATF